Vol. 989 Number 3

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December 18, 1979

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

December 18, 1979 Volume 989 Number 3

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty (PCT) Information	989 OG 22
Reissue Applications Filed	989 OG 22
Patent Notices	
Certificates of Correction for the Week of December 18, 1979	989 OG 23
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	989 OG 24
Condition of Patent Applications	989 OG 25
Reissue Patents Granted (30,167)	751
Patents Granted	
General and Mechanical (4,178,637)	755
Chemical (4,179,267)	973
Electrical (4,179,582)	1059
Design Patents Granted (253,676)	1119
Index of Patentees	PI 1
Indices of Applicants of Reissues and Designs	PI 40
Classification of	
Patents (Including Reissues)	PI 43
Designs	PI 45
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 46
Designs	PI 47
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

July 3, 1979.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,312,124, Re. S.N. 077,353, Filed Sep. 20, 1979, Cl. 74/558, STEERING WHEEL ASSEMBLY FOR AUTOMOTIVE VEHICLES, Klaus Meier, et al., Owner of Record: *Kamei-Autokomfort, Wolfsburg, Germany,* Attorney or Agent: Francis A. Utecht, et al., Ex. Gp.: 352

3,437,032, Re. S.N. 066,881, Filed Aug. 16, 1979, Cl. 100/93, HEATED FUSER ROLL AND METHOD OF MANUFACTURE, Arjan T. Manghirmalani, et al., Owner of Record: *Zerox Corp., Rochester, N.Y.,* Attorney or Agent: Harvey M. Brownrout, Ex. Gp.: 242

3,493,020, Re. S.N. 080,307, Filed Oct. 1, 1979, Cl. 144/34 R, SHEAR TYPE TREE CUTTING DEVICE, Joseph S. Choat, Owner of Record: *Inventor,* Attorney or Agent: Clarence A. O'Brien, et al., Ex. Gp.: 324

3,996,681, Re. S.N. 077,605, Filed Sep. 21, 1979, Cl. 40/116, VEHICLE DISPATCH INDICATOR WITH COLOR-CODED, ALPHABETICAL AND NUMERICAL INDICIA, John H. King, et al., Owner of Record: *said Gore assignor of one-half to said King, Oak Lawn, Ill.,* Attorney or Agent: None, Ex. Gp.: 333

4,048,850, Re. S.N. 080,111, Filed Sep. 28, 1979, Cl. 73/133 R, MECHANISM FOR GAUGING THE CATCH WITHIN A TRAWL NET, Kjell Oystein Ramberg, et al., Owner of Record: *Simrad A.S., Horten, Norway,* Attorney or Agent: Lawrence R. Radanovic, Ex. Gp.: 244

4,052,228, Re. S.N. 080,252, Filed Oct. 1, 1979, Cl. 136/89 PC, OPTICAL CONCENTRATOR AND COOLING SYSTEM FOR PHOTOVOLTAIC CELLS, Charles R. Russell, Owner of Record: *Inventor,* Attorney or Agent: William E. O'Brien, Ex. Gp.: 114

4,076,312, Re. S.N. 079,876, Filed Sep. 28, 1979, Cl. 299/2, METHOD AND APPARATUS FOR RETORTING OIL SHALE AT SUBATMOSPHERIC PRESSURE, Chang Yul Cha, et al., Owner of Record: *Occidental Oil Shale Inc., Grand Junction, Colo.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 354

4,082,142, Re. S.N. 079,511, Filed Sep. 27, 1979, Cl. 165/76, HOUSING FOR EXPANSION UNIT OF COOLING SYSTEM, James R. Blackburn, et al., Owner of Record: *John E. Mitchell Company, Dallas, Tex.,* Attorney or Agent: Rey Eilers, et al., Ex. Gp.: 345

4,084,180, Re. S.N. 078,617, Filed Sep. 24, 1979, Cl. 358/55, COLOR SPLITTING PRISM ASSEMBLY, Jacobus Stoffels, et al., Owner of Record: *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Thomas A. Briody, Ex. Gp.: 233

4,100,056, Re. S.N. 078,616, Filed Sep. 24, 1979, Cl. 208/57, MANUFACTURE OF NAPHTHENIC TYPE LUBRICATING OILS, Ronald W. Reynolds, Owner of Record: *Sun Oil Company of Pennsylvania, Philadelphia, Pa.,* Attorney or Agent: J. Edward Hess, Ex. Gp.: 116

4,110,601, Re. S.N. 080,110, Filed Sep. 28, 1979, Cl. 219/506, CONTROL SYSTEM AND METHOD AND CONTROL DEVICE THEREFOR, Cloyd E. Decker, Owner of Record: *Robertshaw Controls Company, Richmond, Va.,* Attorney or Agent: Auzville Jackson, Jr., et al., Ex. Gp.: 213

4,116,183, Re. S.N. 077,553, Filed Sep. 21, 1979, Cl. 123/122 F, FUEL ATOMIZING UNIT WITH OVEN CHAMBER, Arthur Hayward, Owner of Record: *Electronic Fuel Saver, Inc., Bronx, N.Y.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 342

4,124,943, Re. S.N. 069,830, Filed Aug. 27, 1979, Cl. 35/8 A, AUDIO VISUAL INFORMATION SYSTEM, James A. H. Mitchell, et al., Owner of Record: *Mitchell Beazley Encyclopedias, Ltd., London, England,* Attorney or Agent: None, Ex. Gp.: 334

4,125,499, Re. S.N. 077,444, Filed Sep. 19, 1979, Cl. 260/22 T, WATER-RESTRICTED, WATER SOLUBLE PAINT, Jerald D. Howard, Owner of Record: *Pactra Industries, Inc., Los Angeles, Calif.,* Attorney or Agent: Byard G. Nelsson, et al., Ex. Gp.: 141

4,145,481, Re. S.N. 078,565, Filed Sep. 24, 1979, Cl. 428/678, PROCESS FOR PRODUCING ELEVATED TEMPERATURE CORROSION RESISTANT METAL ARTICLES, Dinesh K. Dupta, et al., Owner of Record: *Howmet Turbine Components Corporation, Muskegon, Mich.,* Attorney or Agent: Dugald S. McDougal, et al., Ex. Gp.: 111

PATENT NOTICES

Certificates of Correction for the Week of Dec. 18, 1979

Re. 30,060	4,124,001	4,155,967	4,166,542
D. 252,481	4,124,151	4,159,365	4,166,628
3,891,916	4,126,702	4,160,280	4,166,826
4,026,419	4,131,779	4,161,163	4,167,935
4,027,450	4,136,503	4,161,681	4,167,997
4,029,235	4,140,384	4,162,254	4,168,366
4,039,571	4,141,761	4,162,279	4,168,391
4,049,589	4,141,772	4,162,347	4,168,405
4,049,666	4,141,841	4,163,002	4,168,810
4,069,336	4,141,843	4,163,554	4,168,837
4,074,221	4,144,213	4,163,709	4,168,850
4,089,029	4,144,578	4,163,721	4,169,033
4,103,093	4,145,465	4,163,841	4,169,140
4,108,408	4,149,185	4,164,963	4,169,294
4,110,952	4,152,344	4,165,309	4,169,377
4,111,680	4,152,418	4,165,324	4,169,418
4,115,457	4,152,666	4,166,039	4,169,634
4,117,118	4,153,643	4,166,134	4,169,659
4,118,404	4,154,833	4,166,255	4,170,095
4,123,300			

Erratum

All reference to Patent No. 4,176,569 to Raymond F. DeLuca of Stamford, Connecticut, for MULTIPLE WOUND ROLL DISPENSER FOR FLEXIBLE SHEET MATERIAL appearing in the Official Gazette of December 4, 1979, should be deleted since no patent was granted.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 3, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-1-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	11-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	2-5-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-30-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	5-19-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-5-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-31-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-1-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	12-12-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-17-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	10-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	11-30-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-4-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	7-10-78

Expiration of patents: The patents within the range of numbers indicated below expire during November 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,061,833 to 3,066,301, inclusive
Plant Patents..... Numbers 2,180 to 2,197, inclusive

REISSUES

DECEMBER 18, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,167

APPARATUS AND METHOD FOR START-SPINNING ON AN OPEN-END SPINNING MACHINE

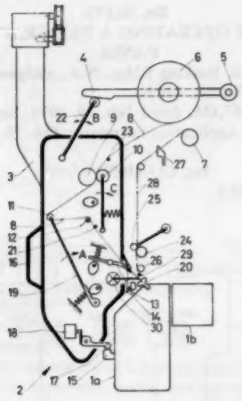
Fritz Stahlecker, Josef Neidhart-Strasse 18, D-7341 Bad Uberlingen, and Hans Stahlecker, Haldenstrasse 20, D-7334 Suessen, both of Fed. Rep. of Germany

Original No. 3,892,062, dated Jul. 1, 1975, Ser. No. 463,151, Apr. 22, 1974. Application for reissue Jul. 1, 1977, Ser. No. 812,411

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1973, 2321775

Int. Cl.[2] **D01H** *15/00, 13/14*

U.S. Cl. 57—263 **33 Claims**



1. An apparatus for start-spinning, movable along an open-end spinning machine to a spinning unit, which returns a thread to a spinning rotor of said spinning unit and removes said thread therefrom again after spinning has been started, containing means for controlling the moment the start-spinning operation is commenced in such a manner that said start-spinning operation is performed during the period in which [the] *a* previously braked spinning rotor of said spinning unit starts up and at a speed which is lower than the operating speed of said spinning rotor, *said spinning machine including a plurality of said spinning units with common driving means, said spinning unit including rotor brake means actuable independently of neighboring commonly driven spinning units, said apparatus including brake control means for controlling actuation and release of the rotor brake means, said means for controlling including means for automatically initiating the start spinning operation in response to release of the rotor brake means to assure piecing during acceleration of the rotor toward its operating speed.*

Re. 30,168

END PLUG FOR ROLLED MATERIALS

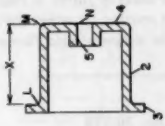
Henry L. Mason, Westport, Conn., assignor to Precision Plastic Industries Inc., Bridgeport, Conn.

Original No. 4,015,711, dated Apr. 5, 1977, Ser. No. 565,246, Apr. 4, 1975. Continuation-in-part of Ser. No. 465,762, May 1, 1974, abandoned. Application for reissue Sep. 22, 1978, Ser. No. 944,885

Int. Cl.[2] **B65D** *85/67, 85/672, 85/676, 85/677*

U.S. Cl. 206—413 **6 Claims**

1. An improved end plug for a rolled goods packaging container which comprises a [circular cylinder known as a] *cylindrical* sleeve having an external surface upon which the rolled goods are placed and an internal surface, [which is] *said sleeve being* concentric to and around a symmetrical axis with a continuous back flange, said back flange being nearly perpendicular to the sleeve[;], the outer diameter of said back flange [is] *being* greater than the sleeve, and a second flange attached continuously to the sleeve [at] *and recessed therein inwardly a distance from* the front of said sleeve, said second flange being concentric to and symmetrical with said sleeve and at least 20% of the area of said second flange being perpendicular to said sleeve, *a first portion of the external surface of*



said sleeve being at an angle of 90° to the back flange for a distance *extending from said back flange of said sleeve* of up to one-half of the sleeve length and [then] *the remainder portion of said sleeve external surface* tapers [at an angle of up to 10% off the vertical] *with a taper of up to 10° inwardly toward said symmetrical axis* and the internal surface *of said sleeve* tapers [at an angle of up to 10° off the vertical with respect to the back flange in the direction of the symmetrical axis] *with a taper of up to 10° inwardly toward said symmetrical axis and from said back flange in the direction of said second flange.*

Re. 30,169

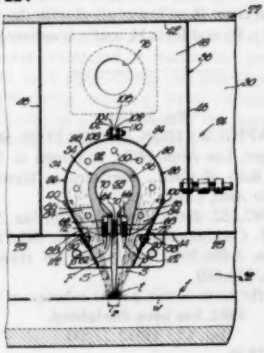
METHOD OF DRYING COATED WEBS

John H. Flynn, 234 Elk Ave., New Rochelle, N.Y. 10802

Original No. 3,962,213, dated Jun. 8, 1976, Ser. No. 435,851, Jan. 23, 1974. Application for reissue Sep. 19, 1977, Ser. No. 834,506

Int. Cl.[2] **B05D** *3/08*

U.S. Cl. 427—224 **15 Claims**



1. A method of drying on a web face an applied coating containing volatile products, which comprises feeding the web past a station at a rate of at least 50 feet per minute, supplying a high-capacity burner at said station with a combustible air-gas mixture to sustain a stable flame sheet and directing the flame sheet substantially with its tip into contact with the

coated face of the fed web transversely thereof for evaporating and igniting the volatile products in the passing coating, and confining the evaporated products to, and completely burning them within a fixed zone through which the coated face of the fed web passes, by directing into contact with the coated face of the fed web on opposite sides of and at a spacing from zero to less than 1 inch from the contacting flame sheet, stable air sheets of a velocity within a range from about 400 feet per minute to about 1700 feet per minute.

15. The method of drying a volatile wet coating on the surface of a body moving past a station, said method comprising the steps of:

(A) directing a sheet of flame toward said body to cause the tip of the flame to impinge on a zone across said wet coating to evaporate the volatiles of said coating; and

(B) directing two sheets of air at high velocity toward said body on opposite sides of the sheet of flame to cause the air sheets to impinge on said wet coating on either side of said zone to substantially restrict the action of said flame to said zone.

Re. 30,170

HYDROLYZABLE POLYMERS OF AMINO ACID AND HYDROXY ACIDS

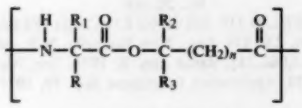
Murray Goodman, Brooklyn, N.Y., and Gerald S. Kirshenbaum, Fanwood, N.J., assignors to Sutures, Inc., Coventry, Conn.

Original No. 3,773,737, dated Nov. 20, 1973, Ser. No. 151,577, Jun. 9, 1971. Continuation of Ser. No. 565,076, Apr. 4, 1975, abandoned. Application for reissue Oct. 11, 1977, Ser. No. 842,379

Int. Cl.[2] C08G *69/10, 69/44*

U.S. Cl. 528—327 **5 Claims**

15. [A] *An absorbable* surgical suture [comprising polyfilaments of the polymer of clam 1] *of a hydrolyzable film- and fiber-forming polymer having a plurality of repeating units of the formula:*



wherein R is lower alkyl, aryl, alkaryl or aralkyl; R_1, R_2 and R_3 are each selected from H or lower alkyl with the proviso that at least one of R_1, R_2 and R_3 is H; and n is an integer of 0 to 2.

Re. 30,171

MULTICONFIGURATION IONIZATION SOURCE

William P. Kruger, Los Altos Hills, and John A. Michnowicz, Santa Clara, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Original No. 3,992,632, dated Nov. 16, 1976, Ser. No. 568,499, Apr. 16, 1975. Continuation of Ser. No. 391,721, Aug. 27, 1973, Pat. No. 3,886,365. Application for reissue Jun. 12, 1978, Ser. No. 914,660

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.[2] H01J *27/00*

U.S. Cl. 250—423 R **9 Claims**

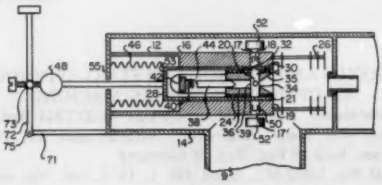
3. An ionization source comprising:

a vacuum tight envelope;

a chamber having walls surrounding an internal cavity and mounted within the envelope, said chamber having a plurality of openings;

an electron source disposed exterior to the chamber for supplying electrons to the chamber through a first of said openings;

sample inlet means for supplying a gaseous sample for reaction with the electrons inside the chamber to create ions, said ions exiting through a second of said openings; and



aperture control means for cooperatively changing the size of the first and second openings for changing the pressure of the sample in the chamber.

Re. 30,172

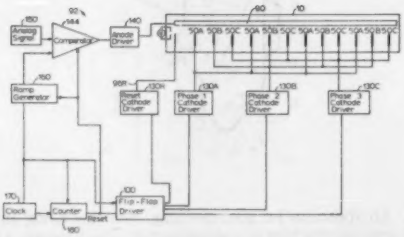
CIRCUIT FOR OPERATING A BAR GRAPH DISPLAY PANEL

Richard A. Saxon, Basking Ridge, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Original No. 3,967,158, dated Jun. 29, 1976, Ser. No. 543,882, Jan. 24, 1975. Application for reissue Jun. 29, 1977, Ser. No. 811,341

Int. Cl.[2] H05B *37/00*

U.S. Cl. 315—169.4 **5 Claims**



1. A bar graph display system comprising

a display panel comprising a gas-filled envelope including a base plate and a viewing face plate hermetically sealed together,

a plurality of thin, parallel, linear cathodes disposed in a series along the surface of said base plate and positioned sufficiently close together so that, as the series of cathodes is energized and selected cathodes are caused to exhibit cathode glow, the glow of adjacent cathodes appears to blend to form a bar of light, said series of cathodes including a first cathode, a last cathode, and intermediate cathodes,

a reset cathode positioned adjacent to and ahead of the first cathode in said series for use in starting a scanning cycle for said series of cathodes,

an anode electrode disposed on said face plate overlying said series of cathodes,

conductors connected to said cathodes and connecting said cathodes in groups with a single common conductor connected to each such group,

a separate cathode driver connected to each common conductor for energizing each cathode in turn along said series of cathodes,

a reset cathode driver connected to said reset cathode and adapted to be energized first before said separate cathode drivers in a cathode scanning cycle,

an anode driver connected to said anode electrode for applying operating potential thereto, and

a circuit coupled to said anode driver including a signal comparator circuit having a single output connected to said anode driver, said comparator circuit having two

inputs, one input comprising a source of a sawtooth voltage, and the second input comprising a source of an analog signal to be represented in said panel by a bar of light made up of a group of energized cathodes, said cathode drivers continually energizing said cathodes in said series and causing said cathodes to exhibit cathode glow as long as there is an output from said comparator and said anode driver is energized thereby and energizes said anode.

Re. 30,173

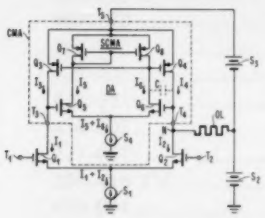
CURRENT MIRROR AMPLIFIER

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Original No. 4,068,184, dated Jan. 10, 1978, Ser. No. 768,593, Feb. 14, 1977. Application for reissue Jul. 31, 1978, Ser. No. 929,679

Int. Cl.[2] H03F *3/45*

U.S. Cl. 330—257 **6 Claims**



1. A current mirror amplifier comprising:

an input terminal;

an output terminal;

a common terminal;

first and second transistors of a first conductivity type, having respective input electrodes, having respective common electrodes connected to said common terminal, and having respective output electrodes connected respectively to said input terminal and to said output terminal; and

a differential-input single-ended-output amplifier having non-inverting and inverting input connections respectively at said input terminal and at said output terminal and having an output connection connected to an interconnection between the input electrodes of said first and said second transistors, said amplifier applying a signal to said interconnection having positive polarity when the potential at said non-inverting input connection is positive relative to the potential at said inverting input connection and having negative polarity when the potential at said non-inverting input connection is negative relative to the potential at said inverting input connection.

Re. 30,174

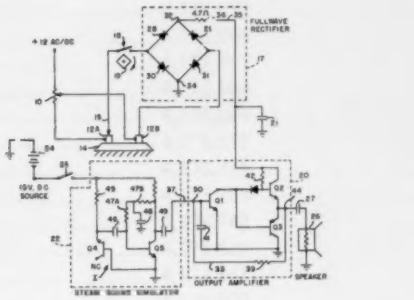
SOUND SIMULATOR FOR MODEL STEAM ENGINE

Walter J. Schedler, 1576 Chickasaw Rd., Arnold, Md. 21012

Original No. 3,913,097, dated Oct. 14, 1975, Ser. No. 502,423, Sep. 3, 1974. Application for reissue Oct. 13, 1977, Ser. No. 841,970

Int. Cl.[2] G08B *3/00*

U.S. Cl. 340—384 E **23 Claims**



1. A sound generation system for a multi-wheeled model steam engine operating at a speed determined by the magnitude of electric power received from a controller, said system comprising:

an electronic circuit for generating a [constant] white noise signal representing a steam sound;

a switch electrically connected to receive electric power from the engine and including an actuator for turning the switch on momentarily at a rate responsive to the operating speed of the engine;

a full wave rectifier connected to receive electric current from the switch;

an amplifier having power terminals connected to receive electric power from the rectifier for providing an output signal responsive to the magnitude of the power received and synchronously with the closing of the switch, said amplifier also having signal input terminals connected to receive said white noise signal;

a capacitor connected across the power input terminals of the amplifier to filter and smooth out the power signal when any brief interruptions occur due primarily to the controller regulation and electrical connections between the engine and power source being momentarily broken;

a sound speaker connected to receive the amplifier output signal with such signal being the amplified white noise signal representing escaping steam occurring synchronously with the operating speed of the engine to simulate the actual sound of a steam engine.

PATENTS

GRANTED DEC. 18, 1979

ERRATA

For CLASS	See PATENT NO.
019–302	4,178,652
433–201	4,178,686
433–013	4,178,687
433–220	4,178,688
433–166	4,178,689
035–005	4,178,695
052–648	4,178,736
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409–080	4,178,834
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123–101	4,178,907
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414–002	4,179,035
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PATENTS

GRANTED DECEMBER 18, 1979

GENERAL AND MECHANICAL

4,178,637
FILLED BODY ROBE
John C. Wrightson, Darien, Conn., assignor to Heritage Quilts Inc., New York, N.Y.
Filed Aug. 29, 1977, Ser. No. 828,270
Int. Cl.[2] A41B 9/00
U.S. Cl. 2—69.5 **2 Claims**

1. A quilted garment adapted to enclose an adult wearer thereof while allowing relatively free movement of the hands external of the garment comprising:

(a) a quilted textile fabric having a back portion and outlying quarter portions, the bottom portion of each outlying quarter portion on each side of which is folded towards the other said outlying quarter portion until they abut;

(b) a first seam joining the bottom of each of the folded outlying quarter portions to the said back portion;

(c) a second seam joining the outer side edge of the bottom portion of one said folder quarter portions to the outer side edge of the bottom portion of the other said folded quarter portion for a distance of approximately one foot;

(d) a slide fastener for joining the outer side edge of one said folded quarter portion to the outer edge of the other said folded quarter portion, said slide fastener extending from substantially the upper end of said second seam to a point approximately thirty inches thereabove;

(e) first fastening means on the outer edge of each said quarter portions positioned at about the end of said slide fastener;

(f) second fastening means at the top of the outer edge of each said quarter portion, each said second fastening means cooperativey attaching to one said first fastening means wherein open unobstructed arm holes are formed for the wearer through which the hands are free to protrude.

4,178,638
SPLIT LEAFLET CHECK VALVES
Louis C. Meyer, Denver, Colo., assignor to Louis C. Meyer, Denver and Anna T. Loeffler, Englewood, both of, Colo.
Filed Aug. 1, 1977, Ser. No. 820,769
Int. Cl.[2] A61F 1/22; F16K 15/03
U.S. Cl. 3—1.5 **5 Claims**

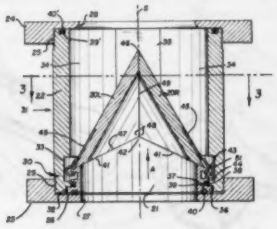
3. A split leaflet check valve comprising:

(a) a base ring having a seat surface at one side thereof and diametrically opposing socket portions at the outer wall thereof;

(b) a pair of diametrically opposed curved leaflets with each having a base edge, side edges extending to a top point and a hinge means extending from the base edge and to a socket portion of the base ring to attach the leaflet to the base edge, and with each leaflet being proportioned such that with the valve closed, each leaflet base edge seats on the base ring seat surface and each leaflet side edge seats against an adjacent side edge of an adjacent leaflet;

(c) a retainer tube wherein said base ring is fitted with said leaflets moving against the retainer tube when they swing to an open position; and

(d) a flat surface on the retainer tube at the side of each leaflet to engage the adjacent leaflet point between the



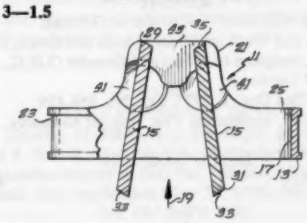
base edge and side edge of the leaflet as the leaflet swings from the open to the closed position and thereby limit lateral shifting of the leaflet during its opening and closing movements.

5. The check valve defined in claim 3, wherein:

the retainer tube is a comparatively narrow member; and

a suture ring is mounted thereon.

4,178,639
TWO-LEAFLET HEART VALVE
Jack C. Bokros, Alpine, Calif., assignor to Carbomedics, Inc., San Diego, Calif.
Filed Apr. 6, 1978, Ser. No. 894,166
Int. Cl.[2] A61F 1/22
U.S. Cl. 3—1.5 **8 Claims**



1. A heart valve prosthesis including

an annular valve body having a central passageway extending therethrough,

a pair of valve leaflets,

means supporting said pair of leaflets for substantially pivotal movement between a closed position blocking blood flow through said central passageway and an open position allowing blood flow therethrough, and

stop means limiting movement of said leaflets between said open and closed positions,

wherein the improvement comprises

said leaflets each having a pair of guides projecting in opposite directions along the pivotal axis of the leaflet which are formed with spheroidal surfaces,

said annular body having a pair of upstanding supports at generally diametrically opposite locations thereon, which supports contain spheroidal depression means proportioned to receive said spheroidal guides, and

wherein said supports are formed with stops outside of said depressions which contact the distal surface of said leaflets

at a region apart from said spheroidal guides and determine the open position thereof.

4,178,640

WRIST PROSTHESIS

Ulrich H. Buechler, 3037 Stuckishaus, Halen 50, Switzerland; Dennis B. Phelps, 4517 Vieja Dr., Santa Barbara, Calif. 93110, and John A. Boswick, Jr., 4502 S. Vine Way, Englewood, Colo. 80110

Filed Feb. 23, 1978, Ser. No. 880,397
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.91 7 Claims

1. A prosthesis for replacing a joint between a first bone structure having first medullary canals and a second bone structure having a second medullary canal, said prosthesis comprising:

(A) a first component having a tubular base with a curved longitudial axis, said base having ends terminating into intermedullary pins for insertion into the first medullary canals; and

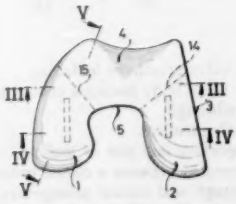
(B) a second component having a generally concave seat for receiving a side of said tubular base and an intramedullary stem extending from said seat for insertion into the second medullary canal.

4,178,641

KNEE-JOINT-ENDOPROTHESE

Hans Grundei, and Wolfram Thomas, both of Lübeck, Fed. Rep. of Germany, assignors to Schutt and Grundei O.H.G., Lubeck, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,226
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703059
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—1.911 4 Claims



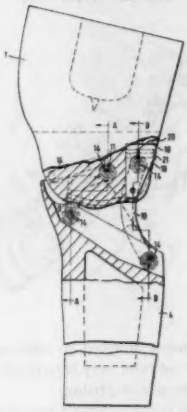
1. A knee-joint endoprosthetic member embodying condylar replacement surface means to simulate the natural slideway for the knee cap, said slideway defining a space for the cruciate ligaments of the natural joint, and a curved boundary to be brought into alignment with the transverse edge of the natural joint which forms the upper boundary of the space for the cruciate ligaments relative to the intercondylar eminence, and wherein the prosthesis for the inner tibial plateau is made concave and the prosthesis for the outer tibial plateau is made saddle-shaped to match the natural tibial plateaus, said members being made from a wear-resistant material.

4,178,642

KNEE JOINT STRUCTURE FOR ARTIFICIAL LEGS

Denis R. W. May, London, England, assignor to J. E. Hanger & Company Limited, London, England

Filed Nov. 14, 1977, Ser. No. 851,323
Claims priority, application United Kingdom, Nov. 18, 1976, 48085/76
Int. Cl.[2] A61F 1/04
U.S. Cl. 3—28 5 Claims



1. An artificial leg comprising a solid shaped knee portion, a solid shaped shin portion, confronting surfaces of each of said portions being each formed with a pair of transverse grooves, a pair of front links each engaged in said grooves and pivotally connected at their opposite ends to said knee portion and said shin portion respectively, and a pair of rear links each engaged in said grooves and pivotally connected at their opposite ends to said knee portion and said shin portion respectively, said front links having an effective length less than that of said rear links, and said pivotal connections of said front and rear links to said knee and shin portion being positioned to form an articulation of which the instantaneous center of rotation lies upon an ascending curve for a predetermined angle of relative rotation between said knee portion and said shin portion from the fully extended position thereof, each said pivotal connection comprising a tubular central distance piece having a portion of reduced diameter at each end thereof, a first tubular bearing piece at one end of said distance piece and of reduced diameter adjacent said distance piece, a second internally threaded bearing piece at the other end of said distance piece and of reduced diameter adjacent said distance piece, the ends of said links being engaged over said adjacent portions of reduced diameter, and a screw passing through said first bearing piece and said distance piece and threaded into said second bearing piece to clamp the links between said central piece and said first and second bearing piece.

4,178,643

VALVE FOR INFLATABLE PROSTHESIS

James E. Cox, Jr., 1257 San Antonio Creek Rd., Santa Barbara, Calif. 93111

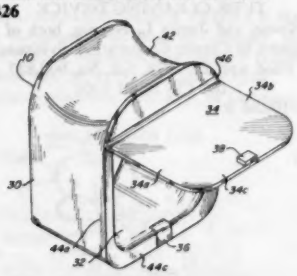
Filed Sep. 26, 1977, Ser. No. 836,736
Int. Cl.[2] A61F 1/24
U.S. Cl. 3—36 8 Claims

6. In combination: an inflatable prosthesis comprising an envelope having a fluid impermeable outside boundary with an aperture therethrough; and a valve mounted to said envelope in said aperture so as to control flow of fluid into and out of said envelope, said valve comprising: a flat enlongated conduit having a pair of sealed edges, and between said edges a pair of flat flexible wall members facing each other to form a fluid seal when they bear against one another, the conduit being open at

one end, and at the other end closed but for a slit formed in one of said wall members without removal of material whereby to have a pair of contiguous slit edges when the slit is closed, said slit being spaced from both of said ends and edges, and thereby being totally surrounded by the material of its respective wall member so that both of said edges are distensible, whereby said valve tends to remain closed both as a consequence of inherent closure of said slit, and also as a consequence of pressure of said walls against one another, said conduit being sufficiently flexi-

ble to receive a fill-tube in said open end, said fill tube when inserted separating the wall members from one another, and when fully inserted holding the slit open; and a layer of viscous gel disposed between said wall members, whereby to improve the sealing properties of the conduit, said layer being non-adhesive and so thin that pressure against the walls does not substantially extrude the gel from the conduit, said wall members projecting beyond said outside boundary of said prosthesis whereby to be available for pressing by the hands of the surgeon to press the wall members together.

4,178,644
WATER SAVING DEVICE FOR TOILET
Dominic A. Zarlengo, 3025 W. Scott Pl., Denver, Colo. 80211
Filed Jul. 21, 1978, Ser. No. 926,631
Int. Cl.[2] E03D *1/00, 11/02, 11/18*
U.S. Cl. 4—426 **13 Claims**



1. Apparatus for reducing the quantity of fluid utilized in flushing a closet type toilet bowl wherein the fluid flows through a trap which defines a passage connecting the bowl to a sewer access opening, said apparatus comprising:

(a) a supporting frame adapted to be positioned in the trap, said frame being designed to conform with the particular contours of the trap so as to remain in position within the trap;

(b) a gate affixed to the supporting frame,

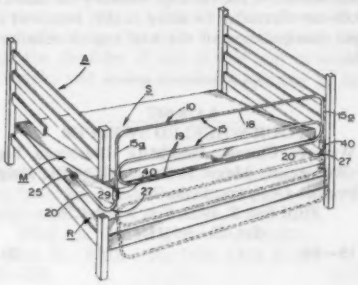
(c) means for retaining the gate in closed position until a predetermined level of fluid is reached in the bowl and for releasing the gate to allow the flow of fluid from the bowl through the trap upon the fluid attaining the predetermined level.

4,178,645
SAFETY BED
Peter A. Cosme, R.R. 1, Box 319, Lockport, Ill. 60441
Filed Dec. 29, 1977, Ser. No. 865,736
Int. Cl.[2] A47C *21/08*
U.S. Cl. 5—426 **8 Claims**

1. A knockdown, readily detachable attachment for the side of a bed and mattress with an underlying support for the latter, comprising

(a) a restraining gate of planar form with vertical end legs, adapted to assume selectively an elevated operative position above the side of the bed and mattress, to block egress therefrom, and an alternative lowered inoperative position below the bed and mattress, to permit egress from the bed, both positions being in the same substantially vertical plane,

(b) anchor means for said gate adapted to be disposed between the mattress and said support, said anchor means comprising a pair of bar members constituting extensions

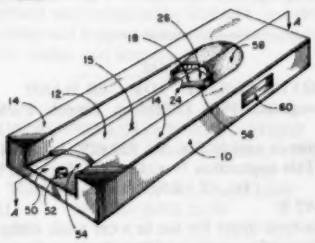


of the respective end legs, each said extension having a free end portion with frictional resistance means against accidental displacement, the other end of each bar member being bent substantially normally to provide a connecting portion between the bar member and its adjacent leg,

(c) linkage means pivoted respectively to each bar member and its adjacent leg, permitting articulation of the gate from said elevated to lowered position, and

(d) relatively slidable means coaxial with each bar member and its adjacent leg for locking the gate in elevated position and, alternatively, freeing the gate for rotation downwardly to inoperative position.

4,178,646
VIAL CAP OPENER DEVICE
Peter J. Swartz, 33 Pine Ave., Randolph, Mass. 02368, and Ronald J. Sostek, 51 Ansie Rd., Chelmsford, Mass. 01824
Continuation-in-part of Ser. No. 780,285, Mar. 23, 1977, abandoned. This application May 26, 1978, Ser. No. 903,880
Int. Cl.[2] B67B *7/36*
U.S. Cl. 7—156 **7 Claims**



1. A device for assisting in opening a vial having a vial sealing cap that incorporates a lift tab, comprising:

a body member having a channel defined therein, said channel having a back wall, a top, an open front, a bottom, and sides which are spaced apart a distance at least slightly greater than the maximum width of the lift tab;

a blade bridging a portion of the front of the channel and

mounted on the body member so as to be approximately parallel to the back wall and spaced forward from it so that when the vial is held perpendicular to the blade adjacent to the back wall and moved so as to bring the vial cap into proximity with the blade, further motion of the vial causes the blade to enter into the space inside the vial cap immediately beneath a portion of the lift tab whereby the lift tab can be more readily separated from the surface of the vial cap; and

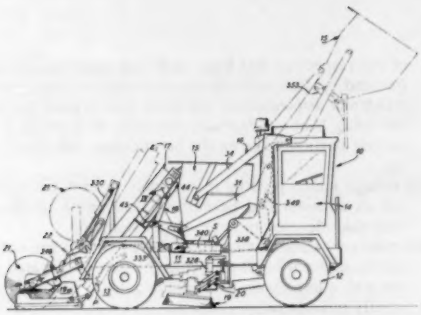
means affixed to the body member for assisting in deforming the vial cap in such a way that a portion of the lift tab is caused to be partially bent away from and out of the outside surface of the vial cap, whereby the balance of the lift tab can thereafter be more readily removed through proper manipulation of the vial cap in relation to the blade.

4,178,647

FOUR-WHEELED SWEEPER

John J. Wolynec, Chicago; Donald L. Hildebrand, Elgin, and Victor Wasynczuk, Mount Prospect, all of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.

Filed Sep. 8, 1978, Ser. No. 940,598
Int. Cl.[2] E01H 1/04
U.S. Cl. 15—84 **20 Claims**



1. A street sweeper having a frame, a cab positioned at a forward end of the frame, main and side brooms on the frame behind the cab, a hopper for receiving sweepings positioned on the frame behind the cab, means on the frame behind the cab for loading sweepings from the main and side brooms in the hopper and hydraulically operated linkage for moving the hopper through an arc over the cab to a dumping position for unloading sweepings into a truck at a forward end of the sweeper.

4,178,648

DRYER CURTAIN FOR CAR WASH

Harry K. Gougoulas, 1875 Philomene, Lincoln Park, Mich. 48146

Continuation-in-part of Ser. No. 929,079, Jul. 28, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 960,374
Int. Cl.[2] B60S 3/04
U.S. Cl. 15—97 B **13 Claims**

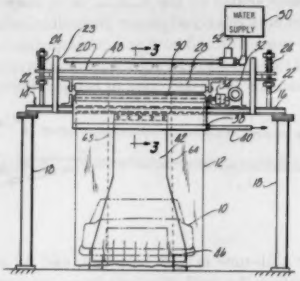
1. A curtain-type dryer for use in a car wash comprising:

an endless loop of material, said loop having at least portions associated therewith for the absorbtion of water from vehicles:

first roller means supporting said loop so as to define a free end which depends vertically into a car wash lane;

and second roller means independent of said first roller means for writing water from said portions,

the combination further including drive means for causing intermittent incremental travel of said loop relative to the first and second roller means, said drive means including sensor means disposed in said wash lane to cause incremental travel of said loop for a circumferential distance less than the total developed length thereof immediately



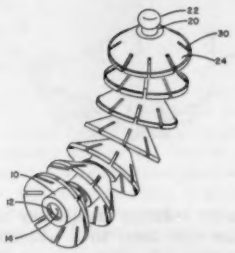
prior to engagement with a car in said lane whereby a freshly wrung area is caused to engage each of said cars in said wash lane in succession.

4,178,649

TUBE CLEANING DEVICE

Charles H. Kouse, and James L. Herzog, both of Springfield, Ohio, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 28, 1978, Ser. No. 900,837
Int. Cl.[2] B08B 9/04
U.S. Cl. 15—104.06 R **8 Claims**



1. A tube cleaning device comprising:

a body extending both in a longitudinal direction and a transverse direction and defining an opening in a first end thereof and a longitudinally extending recess in communication with the opening, wherein the perimeter of the recess is larger than the perimeter of the opening;

a neck extending longitudinally from a second end of the body and having a perimeter less than the perimeter of the opening;

a plug extending longitudinally from the neck and having a perimeter larger than the perimeter of the opening but smaller than the perimeter of the recess; and

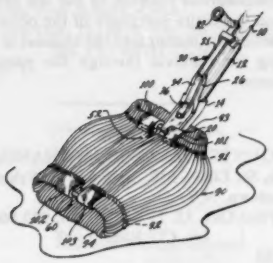
a scraper extending from a side of the body toward the trailing side of the cleaning device at an acute angle to the longitudinal axis thereof, wherein the surface of the scraper facing the leading side of the cleaning device defines a substantially transverse peripheral lip for facilitating cleaning the tube.

4,178,650

SELF-WRINGING MOP

Reuben E. Aasland, 31900 Happy Valley Dr., Indio Hills, Calif. 92240

Filed Jan. 2, 1979, Ser. No. 360
Int. Cl.[2] A47L *13/142*
U.S. Cl. 15—120 R **7 Claims**



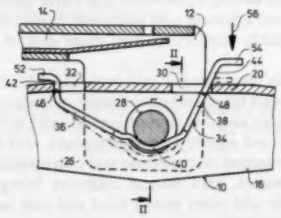
1. In an improved self-wringing mop of the type having a head, a crank having a crank pin journaled in the head, a mop holder carried by the head, a mop spreader having a stem, one end of the stem being secured to the crank pin, the improvements comprising a clamping member configurated to engage an end part of the head and to clamp the mop holder to the head, the clamping member having aperture means for the crank pin, the crank pin extending through the clamping member and a registering aperture in the head.

4,178,651

WIPING ARRANGEMENT FOR A VEHICLE WINDOW

Jürgen Mayer, Gaggenau, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,536
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735627
Int. Cl.[2] B60S *1/40*
U.S. Cl. 15—250.32 **19 Claims**



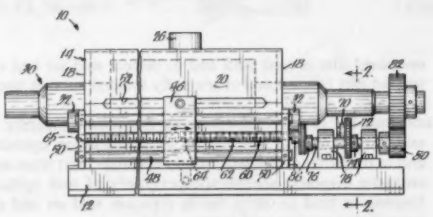
1. A wiping arrangement for a vehicle window, comprising a wiping blade element; a support element, one of said elements being U-shaped and having two side walls and a web which connects said side walls with one another and together with said side walls bounds a hollow, said web of said one element being provided with two holes spaced from one another; an axle movable between a first position in which it extends through said elements so as to pivotally connect the latter with one another, and a second position in which it is withdrawn from said elements so that the latter can be disconnected from one another; and a substantially V-shaped spring member having a central portion surrounding said axle and two diverging legs located at opposite sides of the latter, said legs of said spring member extending through said holes outwardly beyond said one element and being biased to said one element so as to be retained under the spring action of said spring member, said spring member being movable between one position in which it engages said axle so as to retain the same in said first position thereof for connecting said elements with one another, and another position in which said spring member is disengaged from said axle so that the latter can be moved into its second position for disconnecting said elements from one another, each of said legs of said spring member having an end portion which extends outwardly beyond said web of said one element and through said holes and has a width which is smaller than that of the remainder portion of said spring member so that a shoulder is formed between each of said end portions and the remainder portion of said spring member, each of said end portions of said legs of said spring member having an outer section located outwardly beyond said web of said one element and bent in a direction away from said axle so that said web of said one element is clamped between the outer portion and the shoulder of one of said legs of said spring member whereby said spring member is retained by said one element.

4,178,652

APPARATUS FOR CLEANING ROLLER SURFACES

Leo Adams, River Edge, and Edward Kooi, Jersey City, both of N.J., assignors to Arvey Corporation, Chicago, Ill.

Filed Apr. 24, 1978, Ser. No. 899,516
Int. Cl.[2] B08B *3/00, 7/00;* A47L *5/38*
U.S. Cl. 15—302 **6 Claims**



1. Apparatus for cleaning the surface of a roller comprising a base with a housing extending above said base and having opposite end walls, said housing having a lower portion and an upper portion separable to expose an upper open end of said lower portion and each end wall having means defining an opening with a portion of each opening in each portion, support means on each end wall of said lower portion overlapping said openings for supporting a roller in said housing means for supplying pressurized steam with a nozzle connected thereto to produce a small stream of high pressure steam, said housing having an elongated slot through which said nozzle extends, a support member outside said housing for supporting said nozzle for reciprocal movement along said slot, and drive means for reciprocating said support means and simultaneously rotating said roller within said housing.

4,178,653

IMPROVED AGITATOR CHAMBER

Donald B. Tschudy, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Jan. 26, 1978, Ser. No. 872,646
Int. Cl.[2] A47L *5/30*
U.S. Cl. 15—383 **4 Claims**

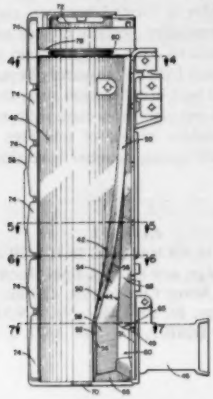
1. An agitator housing for a floor care appliance including an air and entrained dirt entrance disposed at least partly around its periphery and having;

(a) an elongated chamber in said agitator housing, and having a rearwardly located suction opening communicating with said elongated chamber and through which said air and entrained dirt leave said chamber,

(b) an agitator rotatably mounted in said chamber and tending to drive at least a portion of said air and entrained dirt, after its entrance about said periphery, in a generally

circular path between said chamber and said agitator and about the axis of rotation of the latter,

(c) a ledge exterior to said chamber communicating with said chamber and formed by a recess in the wall of said agitator housing exteriorly of said chamber and extending longitudinally thereof, said ledge being slanted upwardly towards the front of said chamber in the longitudinal direction to interrupt the driven movement of the air and



entrained dirt in said path and to deflect said air and entrained dirt toward said rearwardly located suction opening, and

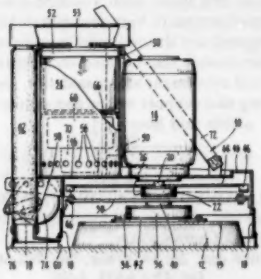
(d) said agitator for driving air being disposed forwardly of said ledge and said rearwardly located suction opening, and in the flowpath of said air and entrained dirt from said entrance disposed around the periphery of said agitator housing to tend to carry, by its rotation, said air and entrained dirt against said ledge.

4,178,654

FLOOR POLISHING MACHINES

Alfred Mitchell, Montrose, Australia, assignor to Alfred Mitchell, Montrose, Australia

Filed Oct. 26, 1977, Ser. No. 845,677
Claims priority, application Australia, Nov. 29, 1976, PC8282
Int. Cl.[2] A47L *11/202*
U.S. Cl. 15—385 **5 Claims**



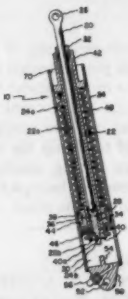
1. A floor polishing machine comprising a housing having an upper substantially horizontal surface and a substantially vertical wall extending around the periphery of the upper surface, a ground engaging skirt depending from the vertical wall and being provided with air inlet means for admitting air to the interior of the housing, a rotary polishing means located within the housing, drive means arranged to rotate the polishing means in a horizontal plane, a fan located within the housing and arranged to be rotated in a horizontal plane when the polishing means is rotated, means forming a channel in a major portion of the periphery of the housing and open to the upper interior of the housing, the formed channel being of gradually increasing thickness to provide a gradually larger zone in cross-sectional area, and a particulate matter collection means in communication with the channel at its point of greatest cross-sectional area, whereby, when the polishing means is rotated the simultaneous rotation of the fan produces an updraught around the entire periphery of the polishing means so as to direct particulate matter into the channel in the periphery of the housing for removal through the particulate matter collection means.

4,178,655

COUNTERBALANCE MECHANISM

Carl H. Little, St. Louis, Mo., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Oct. 12, 1978, Ser. No. 950,560
Int. Cl.[2] E05F *3/00*
U.S. Cl. 16—52 **5 Claims**



1. A counterbalance mechanism comprising in combination:

an outer cylinder having a closed inner end and an open outer end;

an inner cylinder telescopically received within said outer cylinder and having open inner and outer ends;

first means fixed adjacent said outer end of said outer cylinder for slidably supporting said outer end of said inner cylinder;

an outer piston head fixed to said inner cylinder for slidably supporting said inner end of said inner cylinder within said outer cylinder and for dividing said outer cylinder into first and second axially spaced chambers, said first chamber being arranged intermediate said outer piston head and said first means, said second chamber being arranged intermediate said outer piston head and said inner end of said outer cylinder;

resilient means disposed in said first chamber;

a piston rod telescopically received within said inner cylinder;

second means for slidably supporting an outer end of said piston rod;

an inner piston head fixed to an inner end of said piston rod for slidably supporting said inner end of said piston rod within said inner cylinder and for dividing said inner cylinder into first and second axially spaced chambers;

a charge of hydraulic fluid disposed in at least one of the second chambers and said second chambers being disposed in flow communication through said inner end of said inner cylinder, said mechanism being characterized as having a piston rod contracted condition, wherein said second chambers of said outer and inner cylinders have maximum and minimum values, respectively, and a piston rod extended condition wherein said second chambers of said outer and inner cylinders have minimum and maximum values, respectively, and in that said resilient means

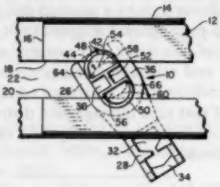
tends to move said outer piston head and said inner cylinder towards said inner end of said outer cylinder for placing said mechanism in said piston rod extended condition.

4,178,656

GLIDE FOR DRAPERY TRAVERSE ROD

Walter J. MacFarlane, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Dec. 11, 1978, Ser. No. 968,266
Int. Cl.[2] A47H *15/00*
U.S. Cl. 16—93 D **10 Claims**



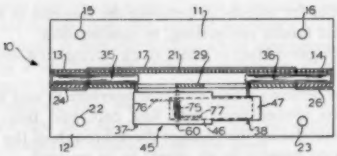
1. A drapery hook support glide for mounting on the slotted track of a drapery rod comprising an upper glide body portion vertically positionable on the exterior of the rod, a head portion positionable within the interior of the rod, a neck portion integrally connecting said body and head portions and positionable within the track slot, and a lower pendant portion for supportably mounting a drapery hook, said pendant portion integrally depending from said upper body portion, said head portion being elongated and having a longitudinal dimension greater than the width of said track slot to provide retentive engagement with the interior of said rod when said body portion is vertically positioned and a transverse dimension less than the width of said slot to permit passage of said head portion therethrough when said body portion is horizontally positioned, said neck portion having interference means thereon for engaging said track upon movement of said body portion out of said vertical position to resist inadvertent movement into said horizontal position and prevent accidental release of said head portion from said rod, said interference means permitting rapid mounting of the glide on the track intermediate the ends of the rod.

4,178,657

SEPARABLE HINGE

Lee V. Way, Jr., Rte. 4, Box 185F, Sumter, S.C. 29150

Filed Nov. 29, 1978, Ser. No. 964,498
Int. Cl.[2] E05D *7/10*
U.S. Cl. 16—173 **4 Claims**



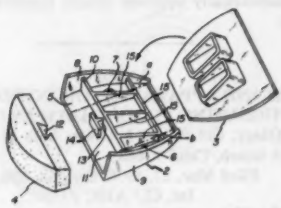
1. A separable hinge, comprising:
(a) a first rectangular hinge plate formed on one side thereof with a central rectangular notch and a pair of aligned hinge pin receiving tubular portions at opposite ends of said plate adjacent said notch;
(b) a second rectangular hinge plate formed on one side thereof with an outwardly extending central hinge pin receiving tubular portion adapted to fit within said first plate notch between said pair of first hinge plate tubular portions to be aligned therewith;
(c) a pair of hinge pins mounted within said second hinge plate tubular portion, said pins being adapted when said first and second plate tubular portions are aligned to be moved outwardly from said second plate tubular portion to enter said first plate tubular portions to effect an assembly of said plates and to be moved inwardly to retract completely within said second plate tubular portion to allow said plates to be disassembled; and
(d) an actuating mechanism mounted on said second hinge plate and comprising a pivotal lever and associated linkage connected to said pins at the inner ends thereof and being adapted when said lever is rotated fully in one direction to cause said pins to retract within said second hinge plate tubular portion to allow the assembled plates to be separated and when rotated fully in the opposite direction to allow said plates when said tubular portions are aligned to be assembled by causing said pins to move outwardly from said second hinge plate tubular portion into said first hinge plate tubular portions to effect an assembly of said hinge.

4,178,658

DOOR STOP WITH REMOVABLE DAMPING MEMBER

Pierre Gergonne, Oyannax, France, assignor to Etablissements Gergonne, Oyannax, France

Filed Jun. 27, 1978, Ser. No. 919,493
Claims priority, application France, Jun. 29, 1977, 77 19995
Int. Cl.[2] E05F *5/02*
U.S. Cl. 16—86 A **7 Claims**



1. A door stop, comprising
(a) a rigid body member including a planar horizontal bottom wall, a pair of generally parallel vertical side walls, and a vertical partition extending between and normal to said side walls, said partition being spaced from one end edge of said bottom wall, thereby to define a recess adjacent one end of said body member;
(b) resilient damping means extending within said recess in contiguous relation with said partition;
(c) connecting means removably connecting said damping means with said body member; and
(d) a cover member removably connected with said body member for retaining said damping means within said body member recess.

4,178,659

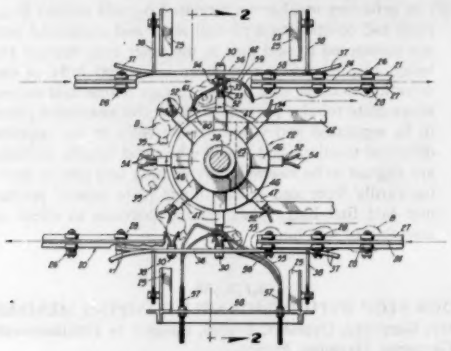
TRANSFER APPARATUS FOR POULTRY PROCESSING CONVEYOR

Michael E. Simonds, Gainesville, Ga., assignor to Stork Gamco, Inc., Gainesville, Ga.

Filed Oct. 31, 1977, Ser. No. 847,086
Int. Cl.[2] A22B *5/00*
U.S. Cl. 17—24 **10 Claims**

1. A transfer apparatus comprising spaced oppositely moving conveyors each having a line of spaced article carriers, an intervening rotary transfer conveyor having spaced article carriers arranged to coact in succession with article carriers on the oppositely moving conveyors, and relatively stationary cam means adjacent to article transfer points between the oppositely moving and rotary transfer conveyors and engageable with articles at the transfer points to force them from the article carriers of one first-named conveyor to the article carriers of the rotary transfer conveyor and from the article carriers

of the latter to the article carriers of the other of said first-named oppositely moving conveyors, and said oppositely moving conveyors comprising a pair of substantially parallel linear conveyors disposed at different elevations relative to said rotary transfer conveyor, and said line of spaced article carriers on each oppositely moving linear conveyor including



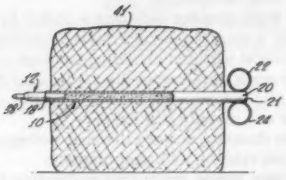
a plurality of equidistantly spaced article suspension shackles, said rotary transfer conveyor having plural circumferentially equidistantly spaced article suspension shackles adapted to register in succession with the shackles of the linear conveyors at two diametrically opposite article transfer points on said apparatus.

4,178,660

METHOD AND APPARATUS FOR INTRODUCING AND DISTRIBUTING FOOD ADDITIVES IN MEATS

Alvin A. Olney, and Rachel I. Olney, both of P.O. Box 1642, Newport Beach, Calif. 92663

Filed Mar. 27, 1978, Ser. No. 890,040
Int. Cl.[2] A22C *17/00*
U.S. Cl. 17—42.1 **3 Claims**



1. Apparatus for introducing and distributing additives into a body of meat consisting of, in combination:

(a) a rigid unitary cylindrical tube having an inside diameter between about 3/16 inch and about 7/16 inch, said tube having a circular opening at each end and having a length sufficient to extend entirely through said body of meat and having an interior cavity adapted to contain a supply of additives, said tube having a distributing end portion and an outer end portion;

(b) an elongated sealing member adapted for detachable connection to the distributing end portion of said tube, said sealing member consisting of:

(i) a sealing end portion adapted to fit within and seal the circular opening of the distributing end portion of said tube and prevent leakage of additives therefrom, said sealing end portion being a solid cylinder whose diameter is just sufficiently smaller than the internal diameter of said cylindrical tube to fit snugly therein,

(ii) a mid portion consisting of a solid cylinder having a diameter intermediate the internal and external diameters of said cylindrical tube, said mid portion being integrally connected with said sealing end portion and in axial alignment therewith, said mid portion terminating at the interconnection with said sealing end portion to form a radially extending shoulder perpendicular to the axis of said mid portion, and

(iii) a pointed end portion having a sharpened tip adapted to be forced through and to penetrate said body of meat without excessive destruction of tissue thereof, said pointed end portion consisting of a tapered solid section ranging in length between about 1.5 and about 3.5 diameters of said cylindrical tube, said tapered section being integrally connected in axial alignment with said mid portion, said tapered section tapering smoothly down from the diameter of said mid portion symmetrically about a straight linear axis to a pointed tip; and

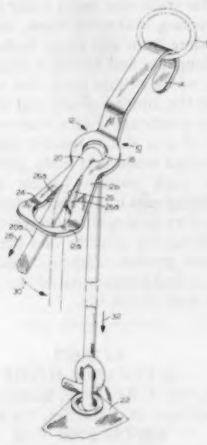
(c) an elongated piston means adapted to fit within the cylindrical opening of the outer end portion of said tube and to substantially seal said outer end portion against leakage of additives therefrom and to displace additives from said interior cavity of said tube through said distributing end portion when said tube is moved axially and concentrically about said piston means.

4,178,661

SELF-CLEATING ROPE HOLDER

Keith W. Klein, 18 Walker Dr., Simsbury, Conn. 06070

Filed Jun. 1, 1978, Ser. No. 911,374
Int. Cl.[2] F16G *11/00*
U.S. Cl. 24—130 **3 Claims**



1. A holder for adjustably belaying the free end of a rope or the like, said holder comprising, in combination:

A. an elongated body of sheet stock having first and second opposed ends;

B. means defining a first enclosed aperture in said body at a location spaced from said first end, said first aperture accommodating the passage therethrough of the free end of a rope running to an object to be secured;

C. means defining a second enclosed aperture in said body at a location adjacent said second end thereof, said second aperture having a non-binding edge adjacent said second end, said second aperture accommodating the passage therethrough of the rope free end extending from said first aperture;

D. means defining a V-shaped slot in said body intermediate said first and second apertures, the wide end of said V-shaped slot being in open communication with said second aperture and the narrow end thereof terminating short of said first aperture, the edge of said first aperture adjacent said slot narrow end being a non-binding, generally later-

ally extending edge, the portions of the body that include said first aperture and said slot forming a generally coplanar mid-section, the portion of said body bounding the side of said second aperture opposite said slot being bent out of the plane of said body mid-section to the side where the rope free end portion extending between said first and second apertures is located; and

E. a portion of said body intermediate said first end and said first aperture being turned back on itself to form a hook accommodating attachment to a stationary object,

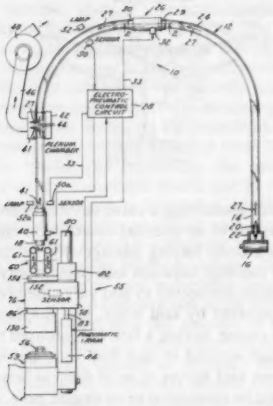
F. whereby the first end of the rope is pulled in a direction away from the stationary object and generally toward the secured object in reflex fashion to draw the rope freely through the first and second apertures to a desired tension, whereupon the rope free end is wedged in said slot to maintain the desired rope tension on the secured object.

4,178,662

SPARK PLUG CONVEYOR AND ASSEMBLING MEANS

Daniel J. Borodin, Detroit, Mich., assignor to U.S. Automation Company, Warren, Mich.

Filed Jun. 5, 1978, Ser. No. 912,192
Int. Cl.[2] B65G *51/02*; H01J *21/02*
U.S. Cl. 29—25.2 **23 Claims**



1. A pneumatic conveyor adapted for transferring fragile parts at high speed comprising a hollow pneumatic transfer line having an upstream end adapted to receive parts to be transferred and a downstream end from which the parts are discharged, first pneumatic vacuum pump means disposed in said line between said ends for generating a first high velocity air stream in said line to propel a part from said upstream end toward said downstream end, second pneumatic vacuum pump means disposed in said line adjacent said downstream end for generating a second high velocity air stream in said line in opposition to said first stream to decelerate a part approaching said downstream end, and means connected to said line between said first and second pump means for exhausting said first and second air streams from said line.

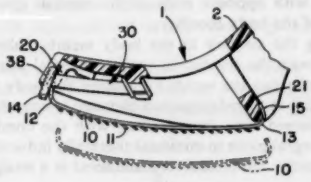
4,178,663

HAND SCRAPER

Robert R. Hayes, Euclid, Ohio, assignor to Oatey Co., Cleveland, Ohio

Filed Aug. 14, 1978, Ser. No. 933,501
Int. Cl.[2] B23D *71/00, 71/04*; B24D *15/04*
U.S. Cl. 29—78 **14 Claims**

1. A tool holder for a scraping or cutting blade having mounting tabs at opposite ends thereof, said tool holder comprising a body portion having a pair of longitudinally spaced transversely extending blade retaining ribs thereon, said ribs being oppositely angularly disposed and extending downwardly and outwardly from the underneath side of said body portion, the longitudinal spacing between said retaining ribs being slightly greater than the spacing between the mounting



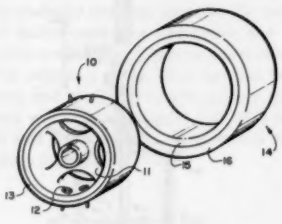
tabs on the blade, at least one of the retaining ribs being somewhat flexible to permit slight inward flexing of said one retaining rib during assembly of the blade mounting tabs onto said retaining ribs for retaining the blade on said tool holder.

4,178,664

ROLLER WITH REPLACEABLE SLEEVE

Nelson E. McLoughlin, P.O. Box 47, Newell, N.C. 28126

Filed Jul. 17, 1978, Ser. No. 925,037
Int. Cl.[2] B21B *31/08*
U.S. Cl. 29—130 **3 Claims**



1. A roller having a readily replaceable sleeve, comprising:

A cylindrical metal roller having a layer of rubber-like material fixedly secured to the outer peripheral surface thereof;

A cylindrical removable sleeve adapted to longitudinally slide onto said metal roller and maintain a concentric relationship therewith, said removable sleeve comprising an inner paper fiber sleeve for slidably receiving said metal roller and frictionally engaging the outer peripheral surface thereof so as to rotate with said metal roller, and a surface coating sleeve of a rubber-like material fixedly secured to the outer surface of said paper fiber sleeve; and

A pointed steel locking nut, said locking nut being die-tapped into said metal roller and extending radially outwardly therefrom through said metal roller and the peripheral surface layer thereof, and with the point of said locking nut extending into the inner paper fiber sleeve of said removable sleeve so as to assist in preventing relative rotational and longitudinal movement between said metal roller and said removable sleeve.

4,178,665

METHOD OF MAKING A FABRICATED GATE VALVE

Willard E. Kemp, and Bert L. Morrison, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 734,155, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 623,236, Oct. 17, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 868,008
Int. Cl.[2] F16K *27/10*; B23K *28/02*
U.S. Cl. 29—157.1 R **3 Claims**

1. A method of making a fabricated gate valve body structure, comprising the following steps:

(a) forming a pair of openings through a hollow cylindrical

body member with the openings being in axial transverse alignment;

(b) inserting a straight continuous conduit through the openings to position the conduit in extension through the body member with opposite ends of the conduit spaced outwardly of the body member;

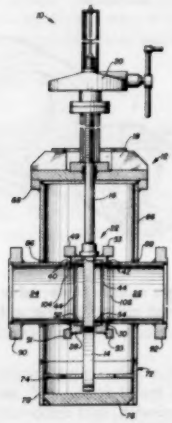
(c) welding the conduit to the body member about each opening with the conduit in a single integral piece;

(d) stress relieving the welds by heating the body member and conduit at a predetermined elevated temperature for a predetermined time then cooling with the conduit in a single integral piece to minimize thermally induced distortion, whereby the conduit is maintained in a straight condition;

(e) thereafter cutting and removing an intermediate segment of the conduit within the body member to form a pair of outer conduit segments which have inner ends spaced apart inside of the body member and which are axially aligned due to the straight condition of the conduit from which the outer conduit segments are formed;

(f) providing a pair of seat support members each having a cylindrical inside surface which presents in an inner end portion thereof a seat pocket of a predetermined depth for receiving a valve seat;

(g) forming in the inside surface of each seat support member



an annular groove having a depth substantially equal to said predetermined depth and located to provide on the inner side of the groove an annular seat supporting lip adjacent the seat pocket and on the outer side of the groove an annular cantilever beam which is substantially equal in size to the lip and which is capable of flexing at the groove relative to the lip to minimize distortion of the lip;

(h) welding a pair of opposed side members to the seat support members to space the support members a predetermined distance apart with the seat pockets in opposition to one another for receiving a gate valve member therebetween;

(i) welding a cylindrical inner conduit segment to the cantilever beam of each seat support member in outward extension therefrom to form a prefabricated seat support assembly which is separate from the body member;

(j) stress relieving the seat support assembly by heating at a predetermined elevated temperature for a predetermined time then cooling with the seat support assembly separate from the body member;

(k) inserting the seat support assembly in the body member with ends of the inner conduit segments abutting the inner ends of the outer conduit segments; and

(l) welding the inner conduit segments to the outer conduit segments from the inside of the conduit segments to mount the seat support assembly in the body member.

4,178,666

METHOD OF ASSEMBLING A VALVE DEVICE FOR AN EXHAUST GAS RECIRCULATION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

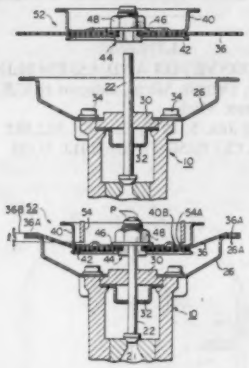
Masahisa Ando, Aichi; Keigo Katow, Toyota, and Masami Yamazaki, Toyokawa, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 696,856, Jun. 16, 1976, Pat. No. 4,120,480. This application Apr. 20, 1978, Ser. No. 898,123

Claims priority, application Japan, Feb. 24, 1976, 51/18419

Int. Cl.[2] **B23P** *15/00;* **F16K** *27/00;* **F16J** *3/02*

U.S. Cl. 29—156.7 R **8 Claims**



1. A method for assembling a valve device for an exhaust gas recirculation system of an internal combustion engine, which device includes a body having passageways connected to an engine, a valve member between said passageways and a diaphragm mechanism connected to said valve member through a rod slidably supported by said body, said diaphragm mechanism includes a casing having a first half secured to said body and a second half secured to said first half, and a diaphragm arranged between said halves so as to form at least one chamber which should be connected to an engine port, said method comprising the steps of:

(a) forming a sub-assembly comprised of said diaphragm sandwiched between a set of plates by means of a sleeve member having a flange portion and a stem portion extending through the diaphragm and the plates, and of a nut member screwed to said stem portion with the diaphragm and the plates held securely between the nut member and the flange portion;

(b) inserting said sleeve member of said formed sub-assembly onto said end of said rod, until a peripheral portion of said diaphragm is rested on a flange portion of said first half of said casing which is secured to said body;

(c) displacing said sleeve member of said formed sub-assembly along said rod while clamping said peripheral portion of said diaphragm to said flange portion of said first half of said casing, in such a manner that the set of plates and the portion of the diaphragm sandwiched therebetween are located in a predetermined position with respect to the first half by means of a positioning member so that said sleeve member is located in a desired position on said rod;

(d) fixedly securing said sleeve member to said rod at the desired position; and

(e) mounting said second half of said casing to said first half of said casing in such a manner that said peripheral portion of said diaphragm is secured between said flange portion of said first half of said casing and a flange portion of said second half of said casing, whereby such a valve device,

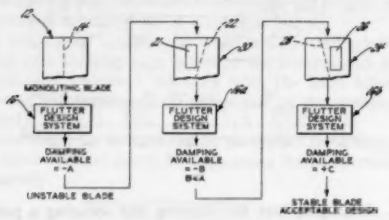
capable of being opened at a predetermined constant vacuum level, is obtained.

4,178,667

METHOD OF CONTROLLING TURBOMACHINE BLADE FLUTTER

Eloy C. Stevens, Indianapolis, and Kenneth Swain, Lizton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1978, Ser. No. 883,688
Int. Cl.[2] B23P *15/02*; G01M *1/32*
U.S. Cl. 29—156.8 B **3 Claims**



1. A method for controlling the first torsional node line position in a rotatable blade of a turbomachine to improve its flutter stability including the steps of: forming a first monolithic blade having an airfoil shape with convex and concave side walls; arranging several of the monolithic blade shapes in a cascade array and subjecting the cascade array to an unsteady flow condition and thereafter determining the unsteady surface pressure forces acting on the monolithic blades; independently determining the first torsional node line of each of the monolithic blades and comparing the resultant surface pressure force on the monolithic blades and its relationship to the first torsional node line to determine whether or not the monolithic blade is absorbing or adding energy to the air flow thereacross; thereafter forming a plurality of first and subsequently modified composite blades by adding dissimilar material to the blade shape of said monolithic blade within the confines of its convex and concave side walls with the location of the dissimilar material and the amount of the dissimilar material being determined by subjecting the first composite blade and modifications thereof to unsteady flow conditions while the first composite blades and modification thereof are located in a cascade array to determine the resultant unsteady surface pressures thereon and comparing such unsteady surface pressures to the location of an independently determined first torsional vibration mode node line positions of the first composite blades and modifications thereof so as to optimize the location of their first torsional vibration mode node line with respect to unsteady surface pressures produced thereon under unsteady flow conditions so as to produce a flutter stable blade.

4,178,668

PIPE TOOL

Leroy George, 7915 W. Orangewood, Glendale, Ariz. 85301

Filed Jan. 6, 1978, Ser. No. 867,604
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—237 **2 Claims**

1. An apparatus for moving the hub end of a first pipe section into sealing engagement with the spigot end of second pipe section having an annular seal thereon when said ends are placed in abutment, said apparatus comprising:

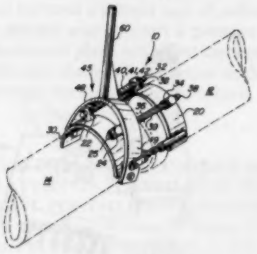
(a) a first generally semi-circular collar adapted to complementarily engage the outer diameter of said first section of pipe in a position in abutment with said hub;

(b) a generally semi-circular bracket adapted to complementarily engage the outer diameter of said second pipe section at a position immediately adjacent and in abutment with said annular seal;

(c) a yoke having an intermediate bight section and oppositely disposed arm sections positioned at opposite ends of said bight section and depending therefrom, each of said arms being pivotally connected to said bracket at opposite sides of said bracket along a common axis which is transverse to said pipe sections;

(d) handle means carried on said yoke for pivotally actuating said yoke;

(e) compressible means extending between said bracket means and said collar means for maintaining said bracket and collar in proper spaced relationship; and



(f) a crank assembly interconnecting said yoke and said collar means, said crank assembly comprising:

(i) a clevis pivotally attached to said yoke means;

(ii) a pivot socket carried on said collar; and

(iii) adjustable means interconnecting said clevis, and said collar for adjusting the relative spacing between said collar and said bracket whereby pivotal movement of said crank will exert a generally axial pipe joining force through said crank assembly urging said pipe sections into sealing engagement.

4,178,669

METHOD FOR CONTINUOUSLY FIXING A PLURALITY OF TUBULAR FASTENERS ONE BY ONE TO A PLURALITY OF APERTURES PROVIDED IN A SUPPORT PANEL

Kunio Hara, Kawasaki, and Kohsaku Yoshida, Funabashi, both of Japan, assignors to Nichi-Ei Bussan Co., Ltd., Tokyo, Japan

Division of Ser. No. 738,463, Nov. 3, 1976, Pat. No. 4,131,009.
This application Mar. 13, 1978, Ser. No. 885,979
Claims priority, application Japan, Nov. 14, 1975, 50-136154
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—412 **4 Claims**

3. A method for continuously feeding and operatively applying pull-lock blind fasteners each having a shaft with a head at one end and a flanged collar carried by the other end comprising the steps of:

(a) providing a fastener fixing means having a fastener loading groove at the forward end thereof;

(b) continuously feeding fasteners successively into the fastener loading groove of the fastener fixing means;

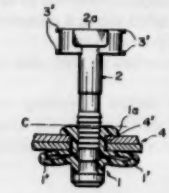
(c) reciprocally stroking the fastener fixing means;

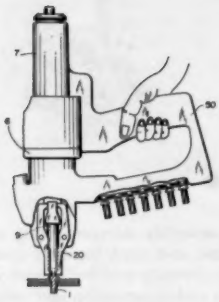
(d) press fitting the flanged collar portion of the loaded fastener into an aperture during the forward stroke of the fastener fixing means;

(e) pulling up the shaft portion of the fastener during a first portion of the rearward stroke of the fastener fixing means to thereby lock the fastener in that aperture;

(f) severing the shaft at a point rearward of the flange of the fastener collar during a second portion of the rearward stroke of the fastener fixing means;

(g) loading the next succeeding fastener into the fastener loading groove of the fastener fixing means and removing





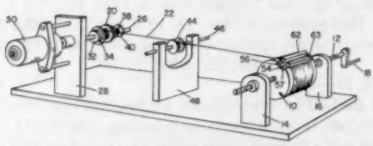
the severed portion of the fastener during a third portion of the rearward stroke of the fastener fixing means.

4,178,670

PROCESS OF FORMING A WIRE PACK

Frederick Schmid, Marblehead, Mass., assignor to Crystal Systems, Inc., Salem, Mass.

Filed Jun. 22, 1978, Ser. No. 917,918
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—417 **9 Claims**



1. The process of forming a wire pack in which a plurality of wires of predetermined length extend between a pair of spaced supports comprising:

wrapping a plurality of turns of wire in a helix arounnd an axially-extending portion of the periphery of a roll while exerting on the wire drag in the direction opposite to the direction of movement of wire passing onto the roll;

placing each of said pair of supports in a respective position spaced from the other of said supports, and extending generally axially of the roll;

fixing each of the plurality of turns of wire wrapped around the roll to each of said pair of supports; and

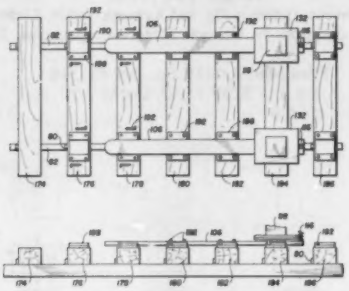
cutting wire segments extending between the spaced pair of supports.

4,178,671

TIE PREPLATING METHOD AND APPARATUS

Dale Luttig, Rte. 1, Emmett, Kans. 66422

Filed Aug. 4, 1977, Ser. No. 821,666
Int. Cl.[2] B23P *19/04;* **E01B** *29/32*
U.S. Cl. 29—429 **31 Claims**



1. A tie preplater for aligning and securing a pair of rail plates to a rail tie comprising:

means for conveying rail ties along a path;

means along said path for aligning the rail seat of a pair of rail plates relative to each other while positioned on a moving respective rail tie; and

means along said path for securing said aligned rail plates to said rail tie by fasteners.

24. A method of securing a pair of rail plates to a rail tie comprising:

conveying said rail tie along a path;

positioning a pair of rail plates on said rail tie;

temporarily attaching said positioned rail plates to said rail tie to travel thereon;

aligning the rail seat of said rail plates relative to each other on said rail tie during the conveying of said rail tie; and

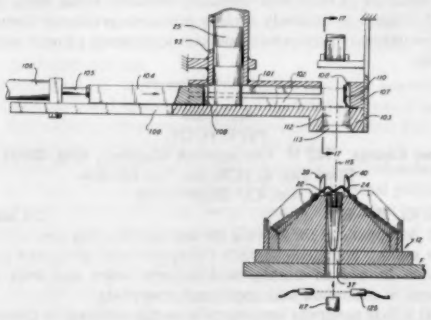
securing said aligned rail plates to said rail tie.

4,178,672

APPARATUS FOR ASSEMBLING AND BANDING AN EXPANSION SHELL

Raymond F. Amico, 8235 Bitternut La., Liverpool, N.Y. 13088, and Peter J. Amico, 4854 Glenfield Dr., Syracuse, N.Y. 13215

Filed May 17, 1978, Ser. No. 906,823
Int. Cl.[2] B23P *11/02, 19/02*
U.S. Cl. 29—430 **14 Claims**



7. Apparatus for assembling and banding together the components of an expansion shell including

a die arranged to support the shell components in a predetermined alignment thereon,

a forming gage positioned over the die having a passage passing therethrough for conforming the shell compo-

nents supported upon said die into an assembled relationship when passed therethrough,

a banding means positioned adjacent to the exit to said passage in the forming gage for positioning a resilient sleeve over the exit of said passage whereby the assembly moved through the gage is passed into said sleeve, and

a dejector for moving the shell components aligned on said die through the passage in the forming gage whereby the components are brought into an assembled relationship and are banded together.

12. The method of assembling and banding together the components of an expansion shell made up of a wedging nut, two shell halves and a strap, the method including

automatically loading the components into a die so that the components are supported in alignment therein,

moving the aligned components from said die through the passage of a forming gage whereby the components are brought into a desired assembly with the shell halves symmetrically positioned on either side of the wedging nut, and

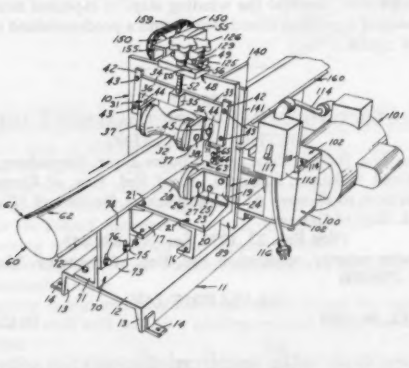
passing the assembly as it leaves the passage of the forming gage into a resilient sleeve for supporting the components in assembly.

4,178,673

PIPE SNAPPER MACHINE AND METHOD

Eugene S. Swanson, and Joel M. Winters, both of Rockford, Ill., assignors to Rockford Machine Tool Co., Rockford, Ill.

Filed Jul. 14, 1978, Ser. No. 924,468
Int. Cl.[2] B23P *11/02, 19/00*
U.S. Cl. 29—453 **14 Claims**



1. In a pipe assembly machine for assembling a finished pipe from a rectangular pipe blank having either a flat or rounded cross section and having a male lock joint member along one longitudinal edge and a female lock joint member along the other longitudinal edge, the combination comprising:

(a) a base member;

(b) a vertical support member on said base member having a front side and a rear side, and a pipe passage formed therethrough;

(c) a pair of spaced apart idler rollers on the front side of said vertical support member for receiving the hand elastically folded and hand assembled leading end of a pipe blank therebetween and exerting pressure on one axis on the pipe blank perpendicular to a plane through the assembled lock joint members; and,

(d) a pair of spaced apart power driven rollers on the rear side of said vertical support member for engaging said leading end of said pipe blank and pulling the pipe blank between the driven rollers and exerting pressure on another axis on the pipe blank perpendicular to the axis of pressure exerted by the idler rollers so as to assemble the male and female lock joint members together.

14. A method for assembling sheet metal pipes from a preformed pipe blank having a male lock joint member along one longitudinal edge, and a female lock joint member along the other longitudinal edge, comprising the steps of:

(a) manually elastically folding a leading end of the pipe blank so as to move the longitudinal edges toward each other;

(b) manually inserting the leading end of the male lock joint member into the female lock joint member on a vertical plane;

(c) encircling the leading end of the pipe blank with a first pair of rollers which are disposed on nonparallel axes to exert pressure on the pipe blank on a vertical plane; and,

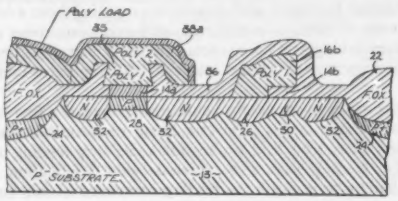
(d) moving the leading edge of the pipe beyond the first pair of rollers and between a second pair of rollers which are disposed on parallel axes to exert a pressure on the pipe blank on a horizontal plane and effect the assembly of the male lock joint into the female lock joint as the pipe blank is moved through the second pair of rollers.

4,178,674

PROCESS FOR FORMING A CONTACT REGION BETWEEN LAYERS OF POLYSILICON WITH AN INTEGRAL POLYSILICON RESISTOR

Sheau-Ming S. Liu, Sunnyvale; William H. Owen, III, Mountain View, and Richard D. Pashley, Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 27, 1978, Ser. No. 890,139
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **6 Claims**



1. In the processing of an MOS integrated circuit on a silicon substrate which circuit includes first and second polysilicon layers, an improved process for providing a polysilicon resistor formed from said second polysilicon layer in contact with a selected member formed from said first polysilicon layer, comprising the steps of:

forming said first polysilicon layer;

forming a silicon nitride layer overlying said first polysilicon layer;

defining a plurality of patterns in said silicon nitride layer;

etching a plurality of members in said first polysilicon layer corresponding to said patterns;

selectively removing said patterns, leaving in place at least a portion of one of said patterns over said selected member;

growing an oxide layer on said substrate;

removing from said selected member the remaining pattern formed from said silicon nitride layer;

forming said second polysilicon layer;

doping said second polysilicon layer to obtain a predetermined resistivity;

forming a mask over a portion of said second polysilicon layer, said portion corresponding to said polysilicon resistor;

again doping said second polysilicon layer such that the doping level under said mask is substantially unchanged;

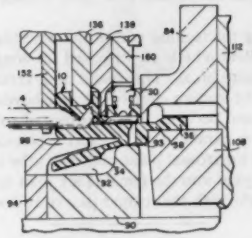
forming at least one line from said second polysilicon layer which includes said portion of said second polysilicon layer corresponding to said polysilicon resistor and which overlies said selected member;

whereby a polysilicon resistor formed from said second polysilicon layer contacts said selected member formed from said first polysilicon layer.

4,178,675
APPLICATOR FOR TELEPHONE CONNECTORS

Howard C. Phillips, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 12, 1978, Ser. No. 895,556
Int. Cl.[2] B23P *23/00*
U.S. Cl. 29—566.1 6 Claims



1. Apparatus for installing a connector on a cable, said connector comprising an insulating housing having a mating end and a cable-receiving end, said ends being oppositely directed, said housing having a top wall, a bottom wall, and sidewalls extending between said ends, a cable-receiving cavity extending into said cable-receiving end towards said mating end, a plurality of side-by-side contact members partially inserted into said top wall adjacent to said mating end, and inwardly deformable strain-relief portions in said top wall adjacent to said contact members, said connector extending from a continuous strip of identical connectors, said strip comprising a carrier strip having said connectors extending laterally from said carrier strip at spaced apart intervals, said apparatus comprising:

frame means, a connector application zone and a first ram in said frame means, said ram being reciprocable towards and away from said application zone, strip feeding means for feeding said strip towards said application zone thereby to position the leading connector of said strip in said zone,

deforming tool means on said first ram, said deforming tool means being engageable with said deformable strain-relief portions of a connector in said application zone upon movement of said first ram from a retracted position towards said application zone, stop means effective between said frame means and said first ram, said stop means being effective to stop motion of said first ram after inward deformation of said strain relief portions of said connector,

a second ram which is reciprocable towards and away from said application zone, contact insertion tool means on said second ram, said contact insertion tool means being engageable with said contact members upon movement of said second ram towards said application zone thereby to drive said contact members into said housing,

compressible coupling means serving to couple said second ram to said first ram whereby,

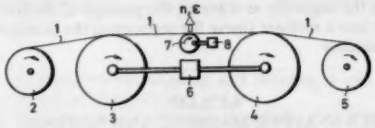
upon positioning a connector in said application zone, inserting a cable into said cable-receiving cavity and upon movement of said second ram towards said application zone, said first and second rams initially move towards said zone and said strain-relief portions of said connector are inwardly deformed whereby said cable is clamped in said cavity and said first ram is stopped from movement by said stop, and said second ram continues to move towards said application zone with accompanying compression of said coupling means, and said contact members are driven into said housing and into electrical contact with the conductors of said cable and,

a connector aligning means for precisely aligning said leading connector of said strip so that said strain-relief portions and said contact members are positioned in alignment with said deforming tool means and said contact insertion tool means respectively, said connector aligning means comprising a primary aligning tool and a secondary aligning tool, said primary aligning tool being engageable with portions of said connector adjacent to said cable-receiving end and being effective to align said connector in an endwise sense, said secondary aligning tool being engageable with said sidewalls of said housing and being effective to align said connector in a sidewise sense.

4,178,676
METHOD FOR TREATING A SUPERCONDUCTOR

Cord-Henrich Dustmann, Leopoldshafen; Curt Schmidt, Karlsruhe, and Gabriel Pasztor, Eggenstein-Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 902,907
Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720119
Int. Cl.[2] H01L *39/24*
U.S. Cl. 29—599 3 Claims

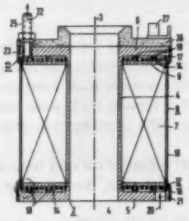


1. In a method of making a superconducting coil from a superconducting wire, including the step of winding the wire to form a coil, the improvement comprising the step of submitting said wire, prior to the winding step, to repeated tension-stressing of a predetermined stretch and a predetermined number of cycles.

4,178,677
SUPERCONDUCTING MAGNET ASSEMBLY AND METHOD OF MAKING

Hanns-Jörg Weisse, Erlangen; Wilhelm Jäger, Nüremberg, and Helmut Uhlmann, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,343
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709300
Int. Cl.[2] H01F *7/06*
U.S. Cl. 29—605 10 Claims



1. A method of forming an impregnated superconducting magnet winding comprising:

(a) disposing a superconducting magnet winding on a coil form having a hollow cylindrical central part and washer-like end flanges, so as to leave a free space at each end between the winding and a respective end flange;

(b) disposing a disk containing a plurality of axial canals in each of said free spaces such as to form a subspace between each of said disks and a respective end flange;

(c) sealing the winding and spaces at the outer periphery thereof so as to form annular cavities at each of said sub-

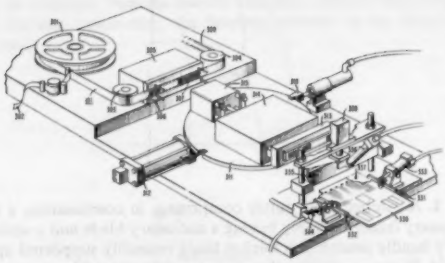
spaces between said disks and said end flanges thereby forming a manifold interior of each of said end flanges;
(d) forming an opening into each of said manifolds;
(e) feeding an impregnating medium through one of said openings to one of said manifolds whereby the medium will flow through said canals in the one disk, through said winding and the canals in said other disk to the other manifold; and
(f) removing excess impregnating medium through the other opening.

4,178,678

APPARATUS AND METHOD FOR AFFIXING BONDABLE FINGER CONTACTS TO A PRINTED CIRCUIT BOARD

Leo Carrillo, Denver, and Thomas C. Madden, Boulder, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1978, Ser. No. 891,039
Int. Cl.[2] B41M *3/08*; H01R *43/00*; B32B *31/00*
U.S. Cl. 29—625 **17 Claims**



1. A method for affixing bondable finger contacts to a printed circuit board wherein the finger contacts are formed out of a strip of electrically conductive material and interconnected by at least one support carrier, the finger contacts having an adhesive tape affixed to one side and a coat of thermally curable adhesive on an opposite side, CHARACTERIZED IN THAT the method includes the steps of
severing at a first station said support carrier;
transferring said finger contacts supported by said tape to a second station;
aligning at said second station said circuit board for engagement with said adhesive coating on said finger contacts; and
bonding said aligned finger contacts to said circuit board.

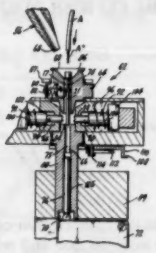
4,178,679

CONTACT CRIMPING MACHINE

Bernard Lichtenstein, 4-26 Second St., Fair Lawn, N.J. 07410

Filed Mar. 13, 1978, Ser. No. 885,768
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—715 **6 Claims**

1. An automatic crimping device for use with a pin having a wire-receiving seat axially aligned with an elongated point, said automatic crimping device comprising: a chamber including a gate with a port displaced from said gate; supply means for providing a continuous flow of said pins at said gate; positioning means for selectively displacing one of said pins through said chamber from a first location adjacent said gate to a second location discharged from said port; a housing including an entrance positioned to receive a pin discharged from said port, a bore axially aligned with said entrance, a plurality of crimping dies in normally spaced relation with each other and radially disposed about said bore below said entrance, actuating means mounted within said bore below said crimping dies, and means for selectively displacing one of said pins from a suspended position removed from said actuating means to an active position engaging said actuating means, when said pin is in said active position its wire-receiving seat being disposed within said bore radially aligned with said crimping dies; and circuit means coupled with said actuating means whereby



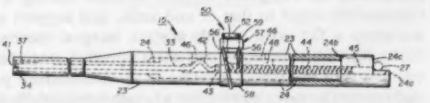
when said actuating means are engaged, said crimping dies are momentarily urged against the wire-receiving seat of said pin and after a time delay, said positioning means displace another of said pins into said second position.

4,178,680

WIRE WRAPPING DEVICE INCORPORATING RELEASABLE BIT LOCKING MECHANISM CONTROLLED BY INSERTION DEPTH OF TERMINAL

Jarrel D. Lyon, Oklahoma City, Okla., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,929
Int. Cl.[2] B21F *15/00, 3/04*
U.S. Cl. 29—751 **26 Claims**



1. A wire wrapping device for wrapping a conductive wire around and in intimate contact with an electrical terminal at a controllable location therealong, said device comprising;
a main housing for said device;
actuable drive means mounted within said housing;
stationary sleeve means secured to said housing, and having an opening extending through the wall thereof;
bit means mounted within said sleeve means, and including a longitudinally disposed, rotatable cylindrical member adapted to be operably driven by said drive means, the forward end of said cylindrical member forming a terminal-receiving recess, the length of which is controlled by a bit means base-defining member that is spring-biased and displaceable in the axial direction over at least a predetermined distance within said cylindrical member, said latter member also including a longitudinally extending slot formed in the wall thereof, and positioned to selectively communicate with the opening in said sleeve means, and
releasable locking means, including an actuably displaceable locking member, supported on said sleeve means, said locking member being adapted to have a portion thereof continuously positioned within the opening of said sleeve means, and another portion thereof selectively positioned within the slot of said cylindrical member, to lock the latter to the sleeve means, the actuable displacement of said locking member out of the cylindrical member slot being dependent on, and responsive to, a terminal to be wire wrapped being inserted within the terminal-receiving recess of said cylindrical member to a depth that causes the associated spring-biased, base-defining member to be displaced said predetermined distance.

4,178,681

KNIFE AND SUPPORT ELEMENT THEREFOR

Ulf Hanses, Borganäsvägen 20, 78100 Borlänge, Sweden

Filed May 2, 1978, Ser. No. 902,027
Claims priority, application Sweden, Nov. 3, 1977, 772240
Int. Cl.[2] B26B *29/02*
U.S. Cl. 30—151 **5 Claims**

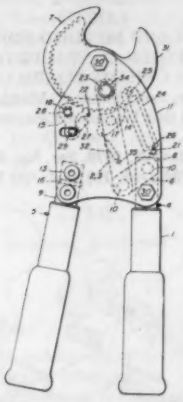
1. In a knife and sheath combination of the type wherein a knife is adapted to be inserted into and releasably latched in a sheath, the improvement wherein said knife comprises an elongated flat-sided handle of substantially uniform thickness having an elongated flat blade attached thereto, said handle being a substantially uniform width along a first portion of its length extending from the free end of said handle toward said blade, said first portion of said handle being substantially equal in width to the width of said knife blade, and said handle being widened outwardly along a second portion of its length to provide a flat-sided first flange which extends integrally from said handle beyond the cutting edge of said knife in a plane parallel to the plane of said blade at a location adjacent the junction of said handle and blade, said first flange having a cylindrical hole extending completely therethrough along an axis transverse to the plane of said knife blade and outwardly of said cutting edge, said hole being of sufficient diameter to permit the insertion of the finger of a user therein, said sheath comprising an elongated support member having a length substantially equal to that of said knife, said support member including a flat-sided sheath portion integral therewith for receiving said knife blade, said sheath portion extending from one end of said support member to an intermediate point on said support member and having a length substantially equal to the length of said knife blade, and said support member including a further flat-sided portion integral with said sheath portion and extending from said intermediate point on said support member to the other end of said support member, said further portion of said support member having a length substantially equal to the length of said knife handle, said further portion of said support member having a first section of substantially uniform width which is parallel to and underlies the uniform width portion of said flat-sided handle when said blade is fully inserted into said sheath portion, and a second section which is widened outwardly of said first section to provide an integral flat-sided second flange which is parallel to and underlies the said first flange of said knife handle when said blade is fully inserted into said sheath portion of said support member, at least part of said second flange being resiliently displaceable relative to said first flange, and a cylindrical protrusion integral with said second flange and extending upwardly therefrom toward said first flange of said knife handle along an axis which is substantially coincident with the axis of said cylindrical hole in said first flange when said blade is fully inserted into said sheath portion, said cylindrical protrusion having a diameter substantially equal to the diameter of said hole and having an upper surface which is inclined downwardly and outwardly relative to the said sheath portion of said support member whereby, when said knife blade is inserted into said sheath portion, said cylindrical protrusion on said second flange snaps into the cylindrical hole on said first flange from the lower end of said cylindrical hole to latch said knife to said support member, and said knife may be unlatched from said support member for removal from said sheath portion by insertion of the finger of a user into the upper end of said cylindrical hole to press against said inclined upper surface of said protrusion and to push said protrusion completely out of said hole by resilient displacement of said second flange on said support member relative to said first flange on said knife handle.

4,178,682

RATCHET CABLE CUTTER

Joseph J. Sadauskas, Marlboro, Mass., assignor to H. K. Porter, Inc., Somerville, Mass.

Filed Aug. 31, 1978, Ser. No. 938,401
Int. Cl.[2] B26B *13/26*
U.S. Cl. 30—250 **2 Claims**



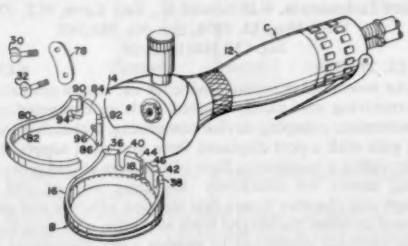
1. A ratchet cable cutter comprising, in combination, a stationary frame assembly having a stationary blade and a stationary handle assembly, a ratchet blade rotatably supported upon said frame, a driving handle assembly rotatably supported upon said frame, a drive lever rotatably supported upon said frame, a pawl rotatably supported upon said drive lever in cooperative relationship with said ratchet blade to drive said ratchet blade forward, a detent rotatably supported upon said frame assembly in cooperative relationship with said ratchet blade to restrain backward movement of said ratchet blade, and a drive link between said driving handle assembly and said drive lever.

4,178,683

KNIFE WITH REMOVABLE BLADE

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 924,914, Jul. 17, 1978. This application Nov. 15, 1978, Ser. No. 960,966
Int. Cl.[2] A22C *17/04, 17/12*
U.S. Cl. 30—276 **6 Claims**



1. A hand knife suitable for use in the packing house and related industries comprising a handle assembly having a concave arcuate surface at one end with two tapped apertures opening thereinto, a drive gear adjacent to the arcuate surface of the handle assembly between the tapped apertures opening

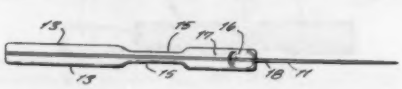
thereinto and rotatably supported in the handle assembly, a ring-like blade housing member of short axial length having portions of greater axial length at one end thereof having apertures therein, headed and threaded fasteners extending through the apertures in the housing member and threaded into the tapped aperture in the handle assembly detachably securing the housing member to the handle assembly, a ring-like blade member having an axial length about twice that of the housing member rotatably supported in the housing member and having a cutting edge at one end projecting from the housing member extending through an aperture therein and gear teeth at its opposite end in mesh with the drive gear, characterized by said knife having a split ring-like member within the blade thereof guiding the movement of a part of a product being severed from a product being processed in its movement through the blade connected to the handle assembly by the same fasteners which connect the housing member thereto and by the apertures in the housing member being slots opening into the end of the housing member opposite to the end from which the cutting edge of the blade projects, whereby the housing member and the blade carried thereby can be removed from the handle assembly without removing the fasteners connecting the housing member to the handle assembly.

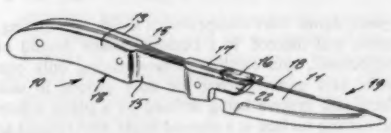
4,178,684

COMFORT GRIP CUTLERY

Pamela Mightly, 1770 Grand Concourse Apt. #5D, Bronx, N.Y. 10457

Filed Apr. 10, 1978, Ser. No. 894,912
Int. Cl.² B25G *3/00*
U.S. Cl. 30—344 **2 Claims**





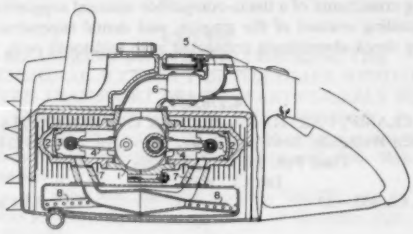
1. A comfort-grip cutlery, comprising in combination, a knife including a steel blade and a handle at one end of said blade, said handle being comprised of a pair of plates positioned on opposite sides of said blade therebetween, a single, longitudinally extending depression on an outer side of each said plate for receiving either a right or left hand thumb, said depressions extending a full length vertically between an upper and lower edges of said plates and extending across a longitudinally intermediate portion of said handle, and a depression upon an upper edge of said handle for receiving a finger tip, wherein the last said depression for receiving a finger tip on said handle upper edge is at a forward extension of the handle over the top of the blade and includes at the center of said finger tip depression a depression in the top of the blade, said finger tip depression being oval-shaped at its edge and downwardly inclining toward the center thereof.

4,178,685

CHAIN SAW

Hisashi Inaga, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Jul. 21, 1978, Ser. No. 926,994
Claims priority, application Japan, Jul. 29, 1977, 52-101778[U]
Int. Cl.² B23D *57/02*
U.S. Cl. 30—381 **2 Claims**



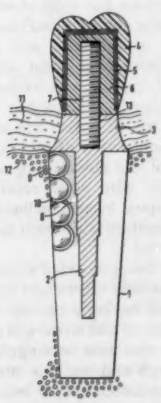
1. A chain saw comprising: a two-cycle opposed cylinder engine of simultaneous ignition type, said engine having at least a pair of cylinders which are made to oppose to each other in the back and forth direction; an intake system disposed in the space above said engine and including a carburetor and so on; an exhaust system disposed in the space below said engine; and a main body section of the chain saw having chain-saw handling handles disposed in the back and forth direction, said main body section being connected to and held by opposite end portions of said engine section through vibration-absorbing resilient members.

4,178,686

ARTIFICIAL TOOTH WITH IMPLANTABLE TOOTH ROOT

Guido Riess, Marienplatz 7, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany; Helmut Heide, Schwalbach, Fed. Rep. of Germany; Roland Reiner, Eschborn, Fed. Rep. of Germany; Kari Köster, Lorsbach, Fed. Rep. of Germany, and Günther Brötz, Stierstadt, Fed. Rep. of Germany, assignors to Guido Reiss, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,336
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733394
Int. Cl.² A61C *13/00*
U.S. Cl. 433—201 **20 Claims**



1. An artificial tooth including an implantable tooth root, said tooth root being essentially constituted of a biostable

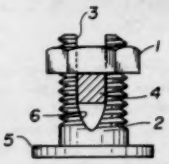
polymer matrix compatible with human tissue; reabsorbable, bioreactive calciumphosphate in finely dispersed form being introduced in said polymer matrix; a thin, porous layer of essentially non-reabsorbable calciumphosphate encompassing said bioreactive calciumphosphate; a core being inserted in said polymer matrix, said core forming connecting means for mounting of a dental superstructure thereon; and an intermediate member being arranged in the region of the tooth neck encompassed by the gingiva and extending between the tooth root and the dental superstructure, said intermediate member being constituted of a tissue-compatible material supportive of the sealing contact of the gingiva, said dental superstructure being shock-absorbingly connected with said tooth root.

4,178,687

CLAMP, PARTICULARLY FOR ORTHODONTIA

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Feb. 28, 1977, Ser. No. 772,595
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—13 **15 Claims**



1. In combination with a rectangular orthodontic wire of given rectangular cross-sectional dimension, an orthodontic clamping device for clamping said rectangular orthodontic wire comprising:

a screw member having an external thread thereon;

a nut member having an internal thread which is threadably engageable with the external thread of said screw member;

said screw member having a notch thereacross to receive said rectangular orthodontic wire therethrough, the depthwise direction into said notch being at least generally towards one end of the thread on said screw member, said notch opening on a surface of said screw and having a first portion adjacent said opening which is defined by substantially flat and substantially parallel opposing walls which are spaced apart to receive said rectangular orthodontic wire therebetween with opposite flat surfaces of said rectangular orthodontic wire adjacent respective opposing substantially flat walls of said notch so that said wire is substantially non-rotational in said notch about the longitudinal axis of said wire, and said notch having a second bottom portion adjacent said first portion and remote from said opening, said second portion being generally V- or U-shaped and defined by inclined walls which are directed toward each other and toward the bottom of said notch, the inclination of said inclined walls of said second portion of said notch being such that said rectangular orthodontic wire when received in said second portion is intercepted by said inclined walls near the portion where said inclined walls meet said opposing substantially flat walls; and

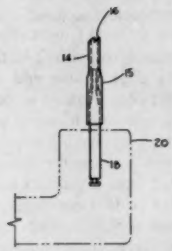
said screw member being threaded along its length at least to a position substantially where said bottom portion of said notch begins, and having a resilient quality whereby on turning at least one of said screw and nut members relative to the other so that said rectangular orthodontic wire positioned through said notch is intercepted by said nut member and then forced deeper into said second portion of said notch, the angle of said inclined notch walls is increased, the wire is clamped by said members and said nut member is locked on said screw member.

4,178,688

REMOVING POST FROM HUMAN BONY STRUCTURE

Walter R. Polanin, 17802 Dogwood La., Hazel Crest, Ill. 60429

Filed Mar. 24, 1977, Ser. No. 781,019
Int. Cl.[2] A61C *3/02*
U.S. Cl. 433—220 **6 Claims**



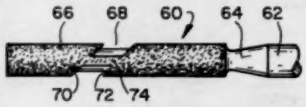
1. In a method of removing a post secured within a hole of a human tooth, the steps of measuring the length of said post in an x-ray picture thereof, then positioning a rod within a cylindrical drill having tooth cutters at one end and locking said rod within said drill with the inner end of said rod at a distance from said cutters approximately equal to the length of said segment and then rotating said drill with said cutters positioned around said post while forcing said drill toward the inner end of said hole until said rod abuts said post.

4,178,689

DENTAL BURR

John E. Nash, Downington, Pa., assignor to Star Dental Manufacturing Co., Inc., Valley Forge, Pa.

Continuation of Ser. No. 668,334, Mar. 19, 1976, Pat. No. 4,058,898. This application Aug. 10, 1977, Ser. No. 823,366
Int. Cl.[2] A61C *3/06*
U.S. Cl. 433—166 **5 Claims**



1. A one-piece dental burr comprising a shank terminating, at the operative end thereof, in a cutting surface devoid of teeth-like projections, said cutting surface having only one groove therein, said groove being the only groove in said cutting surface, said groove being defined by a plane which encircles said cutting surface at a skewed angle with respect to the axis of rotation of said burr, said groove only partially encircling said cutting surface and having curved side walls, said groove providing an oscillatory chip clearing action as the burr is rotated to thereby afford fast chip clearance.

4,178,690

METHOD FOR MAKING A SWIMMING POOL COVER TEMPLATE

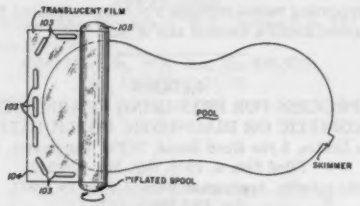
Harry E. Aine, 1804 Stierlin Rd., Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 734,349, Oct. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 613,443, Sep. 15, 1975, Pat. No. 3,927,427, which is a continuation-in-part of Ser. No. 367,198, Jun. 5, 1973, abandoned. This application Jan. 7, 1977, Ser. No. 758,021
Int. Cl.[2] G01B *3/00*
U.S. Cl. 33—174 G **2 Claims**

1. In a method for making a swimming pool cover template the steps of:

placing a sheet of translucent material over the swimming pool;

feeding air at positive pressure under said sheet to hold it off the pool water as said sheet is placed over the swimming pool;



weighting the margins of said sheet to hold it in position over said pool; and

marking the translucent sheet as placed over the swimming pool to conform to the contour of the pool, whereby a template of the swimming pool is fabricated.

4,178,691

ELECTRONIC DIGITAL SCALE

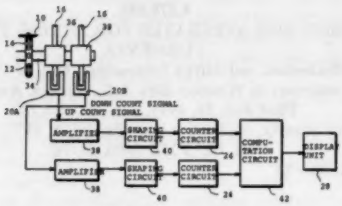
Iwao Tateishi, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1977, Ser. No. 819,686

Claims priority, application Japan, Jul. 30, 1976, 51/103762[U]; Jul. 30, 1976, 51/103763[U]

Int. Cl.[2] G01B *5/02*

U.S. Cl. 33—139 **3 Claims**



1. An electronic digital scale comprising:

an extensible member adapted to be extended and retracted from a housing of the electronic digital scale;

a first plate including a plurality of spaced sprockets, said sprockets being adapted to engage said extensible member and rotate in unison with the movement of the extensible member in a forward direction and a backward direction;

forward movement responsible means driven only in a relationship to the movement of the extensible member in the forward direction;

means for developing count up information in response to the movement of the forward movement responsible means;

backward movement responsible means driven only in a relationship to the movement of the extensible member in the backward direction;

means for developing count down information in response to the movement of the backward movement responsible means;

a shaft means fixed to said first plate, said forward movement responsible means and said backward movement responsible means such that said forward and backward movement responsible means are driven in unison with said first plate in the forward movement and the backward movement

a forward counter circuit responsive to said count up information developing means for calculating the count up information;

a backward counter circuit responsive to said count down information for calculating the count down information; and

a computation circuit responsive to said forward counter circuit and said backward counter circuit for determining count information corresponding to the count up information and the count down information.

4,178,692

MEASURING DEVICE FOR CHECKING THE DIMENSIONAL ACCURACY OF THE TRACK WIDTH OF CURVED TRANSPORT TRACKS, PARTICULARLY FOR CONTINUOUS CASTING OR EXTRUSION

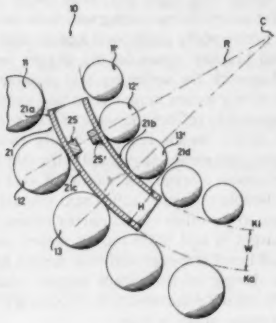
Helmut Schultz, Dortmund, Fed. Rep. of Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Apr. 18, 1977, Ser. No. 788,370

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617143

Int. Cl.[2] G01B *5/14, 3/46*

U.S. Cl. 33—182 **9 Claims**



1. A measuring device for checking the dimensional accuracy of the track width of curved transport tracks formed by paired rollers lying on a radius of curvature equidistantly from each other at elevated temperatures, comprising:

(A) carrier means placeable into a transport track and moveable along the transport track, said carrier means including:

(a) a plurality of latterally spaced elongated members, each of said members having a height corresponding to the track width, a length providing continuous spanning of at least two successive roller pairs when said members are placed in said transport track, and contours corresponding at least approximately to the curvature of the transport track;

(b) connecting means extending intermediate each of said elongated members to interconnect said members one to the other; and

(c) bar means intermediate said elongated members and connecting means for permitting the carrier means to have a height reducible by external effects;

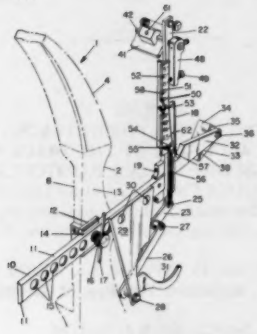
(B) at least two displacement sensing means on at least one of said members and spaced apart at a distance dependent on the track width, said displacement sensing means being located on a radius of the circle of curvature of said track and continuously at a perpendicular orientation to said curved transport track when moving along said track on said carrier means for checking the dimensional accuracy of the track width perpendicular to said curved transport track.

4,178,693

SPLIT IMAGE BOW SIGHT AND RANGE FINDER

Gene D. Smith, 4113 Edwinstowe, Colorado Springs, Colo. 80907

Filed Oct. 30, 1978, Ser. No. 955,592
Int. Cl.[2] F41G 1/46
U.S. Cl. 33—265 10 Claims



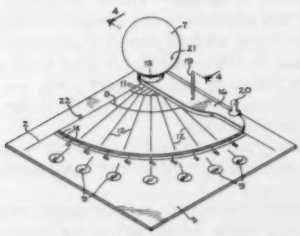
1. A split image bow sight and range finder assembly comprising bracket means for mounting said sight on a bow relative to an arrow horizontally positioned against said bow, slidable means on said bracket means having trigger means pivotally associated therewith for actuating said slidable means, vertically spaced mirror means mounted on said slidable means and angularly oriented to reflect an image of a target to the archer, one of said mirror means being pivotally mounted on said slidable means, cam means associated with said bracket means and slidable means whereby actuation of said trigger means moves said slidable means to adjust said pivotal mirror means with reference to the other of said mirror means and reflects an image of a target in said latter mirror means, and range scale means on said bracket means and cam means for determining target range during mirror means trigger means controlled adjustment to enable determination of the angle of bow elevation before release of the arrow.

4,178,694

POINT-OF-AIM INDICATOR

Maurice C. Bonney, 48 Primrose St., Aptos, Calif. 95003

Filed Dec. 20, 1976, Ser. No. 752,604
Int. Cl.[2] G01C 15/00; A63B 21/00; A63D 13/00
U.S. Cl. 33—289 5 Claims



1. A point-of-aim indicator for pool balls or the like which comprises

a relatively flat base member,

means forming a center line on said base member adapted for horizontal alignment with the central vertical axis of an object ball,

means on said base member indicating the desired contact point of a cue ball with the object ball, and

means on said base member correlated with said contact point to indicate the point of aim for the cue ball to establish contact with the object ball at said contact point,

said contact point indicating means including a simulated object ball having an indicating point on its surface, and

means supporting said ball for angular adjustment about a vertical axis aligned with said center line wherein said ball supporting means includes a pointer supported for pivotal motion about a vertical axis of said ball.

4,178,695

NEW PROCESS FOR PREPARING PHARMACEUTICAL, COSMETIC OR DIAGNOSTIC FORMULATIONS

Angelo Erbeia, 6 rue René Blanc, 74100 Annemasse, France

Filed Feb. 6, 1978, Ser. No. 875,542
Claims priority, application France, Sep. 19, 1977, 77 28193
Int. Cl.[2] F26B 5/06
U.S. Cl. 34—5 20 Claims

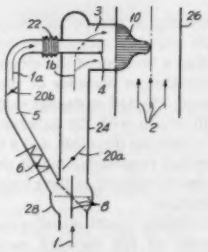
1. A process for preparing pharmaceutical, cosmetic or diagnostic formulations by the freeze drying of at least one substance contained in at least one solvent, comprising locally and progressively cooling in a controlled manner while agitating the solvent containing said substance so as to produce microcrystals of solvent which are put in suspension in the remainder of the liquid until the obtainment of a high-viscosity microcrystalline complex system comprising essentially isolated microcrystals of solvent in intimate mixture with interstitial liquid phases having a high concentration of the initially present substance, hardening the microcrystalline complex system by cooling at a temperature of about −50° to −70° C. and then lyophilizing the hardened microcrystalline complex system.

4,178,696

METHOD AND APPARATUS FOR MIXING TWO GAS CURRENTS

Georg Beckmann, and Alfred Trötzmüller, both of Vienna, Austria, assignors to Waagner-Biro A.G., Vienna, Austria

Filed Jun. 19, 1978, Ser. No. 916,788
Claims priority, application Austria, Jul. 1, 1977, 4685/77
Int. Cl.[2] F26B 7/00, 21/10
U.S. Cl. 34—13 13 Claims



1. A method for mixing a first relatively cool gas current and a second relatively hot gas current comprising the steps of:

separating the first gas current into a first partial gas current and a second partial gas current, said first partial gas current being smaller and having a greater velocity than said second partial gas current;

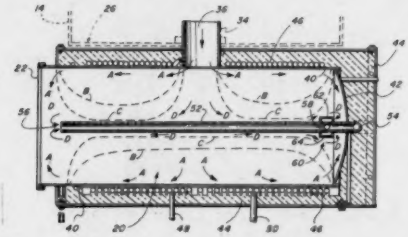
directing said second partial gas current into a ring nozzle, said ring nozzle being in fluid communication with said second gas current;

directing said first partial gas current into a central nozzle in fluid communication with said second gas current, said ring nozzle concentrically surrounding the central nozzle; and

directing said first and second partial gas currents into said second gas current, the velocity of said first partial gas

current being greater than the velocity of said second partial gas current.

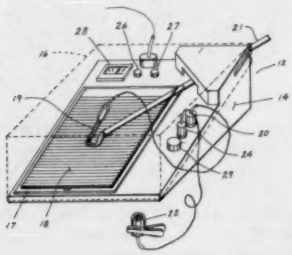
4,178,697
CONDENSATION CHAMBER FOR FREEZE DRYING APPARATUS
David T. Sutherland, Woodstock, N.Y., assignor to The Virtis Company, Gardiner, N.Y.
Filed Mar. 28, 1978, Ser. No. 890,976
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 **4 Claims**



1. In apparatus for freeze drying moisture containing items of the type including a sealable vacuum tight drying chamber for holding the moisture containing item, a hollow vacuum-tight condensation chamber communicating with the drying chamber, a means for supplying heat to the drying chamber, a vacuum pump communicating with the condensation chamber for evacuating air from the drying chamber through the condensation chamber, a refrigeration compressor, refrigeration coils connected to the refrigeration compressor, the refrigeration coils being positioned around the condensation chamber to cool the hollow interior of the condensation chamber; wherein the improvement comprises:

means for causing air evacuated from the drying chamber to flow substantially uniformly over the entire cooled hollow interior of the condensation chamber so that moisture sublimated from the moisture-containing item will freeze substantially uniformly on the hollow interior of the condensation chamber thereby maximizing moisture removal for the volume of the condensation chamber before there is a necessity for removal of the frozen moisture from the condensation chamber.

4,178,698
TEACHING SYSTEM
William D. Cornell, 907 Camargo Dr., Ballwin, Mo. 63011
Filed Sep. 28, 1977, Ser. No. 837,377
Int. Cl.[2] G09B *5/06*
U.S. Cl. 35—8 A **17 Claims**



1. A system for recording and subsequent playback of the audio and graphic presentation of a classroom, teaching experience comprising;

a microphone for inputing the audio text,

a writing desk with a writing instrument connected to displacement transducers for inputing writing instrument coordinate position information,

a writing instrument incorporating a switch means capable of signaling writing instrument contact with the writing surface,

an oscillator connected to the writing instrument switch means,

means for pulse width modulation encoding of the writing instrument coordinate analog signals,

means for differentiation of the pulse width modulation encoded analog signals,

record circuits for recording the audio, the writing instrument switched tone signals and the differentiated pulse width modulation encoded writing instrument coordinate analog signals,

four record/playback head channels,

four erase head channels,

a tape transport,

a playback circuit for the audio text,

a playback circuit for the writing instrument controlled tone signal plus rectifier and integrating capacitor driving a solid state relay which controls the writing means of the plotter,

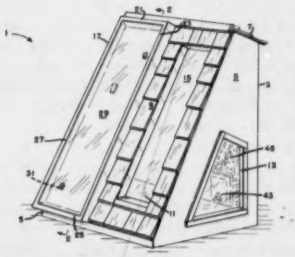
means for decoding the twice differentiated pulse width modulation encoded writing instrument coordinate analog signals,

a plotter for receiving the decoded writing instrument coordinate analog signals plus the electrical writing control from the solid state relay and reproducing the graphic portion of the text,

an audio transducer for reproducing the audio portion of the text,

switching means for controling the record and reproduction functions.

4,178,699
SOLAR ENERGY TEACHING AID
Carol A. Burkhart, Rte. 29, R.D. #1, St. Johnsville, N.Y. 13452
Filed Jul. 6, 1978, Ser. No. 922,325
Int. Cl.[2] G09B *25/00*
U.S. Cl. 35—10 **10 Claims**



1. A solar energy teaching aid for use in instruction and experimentation to demonstrate the effects and results of active and passive home heating through solar energy, said teaching aid being in the form of a miniature home unattached to the ground and comprising a rear wall, side walls, angled roofs and a floor representing discrete surface areas with one of said roofs having the largest surface area: such roof mounting an active collector to absorb solar energy and convert same to heat energy, said active collector having means for communicating with the interior of such home to permit the movement of cooler air from such home through said active collector, for the heating of such cooler air in said active collector and the discharge of such active-collector heated air into the interior of such home, to thereby demonstrate active home heating; and such roof having a transparent means, said home having heat

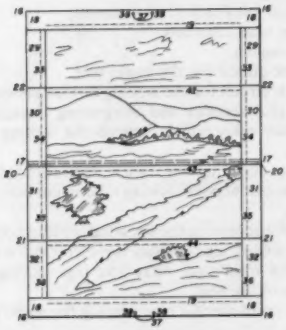
sink means to passively absorb solar energy, convert same to heat energy and store same, said transparent means and heat sink means cooperating to demonstrate such passive home heating by said transparent means allowing solar energy to pass therethrough to said heat sink means where such solar energy is absorbed, converted to heat energy and stored.

4,178,700

BIBLE BOARD WITH BIBLE CUTOUTS

Avis M. Dickey, South Milford, Ind., assignor to Dickey, Inc., South Milford, Ind.

Filed Nov. 21, 1977, Ser. No. 853,021
Int. Cl.[2] G09B *1/06*
U.S. Cl. 35—23 R **1 Claim**



1. An appropriately decorated improved Tell Board with Show Pieces wherein to a firm rectangular backing with horizontal center fold is permanently affixed in layered sequence four rectangular panels of 12-ply matting board or comparable weight material, in width coextensive to the backing and in height equal to one-fourth the backing length plus one and one-fourth inches for panels one and four, plus two and one-half inches for panel two, and plus three/fourths inch for panel three, each top edge of panels two, three, and four overlapping the bottom edge of the previously affixed panel by 1¼ inches and unaffixed in the said 1¼ inch overlapping to within border depth of the panel sides, thereby creating slot pockets; pockets being additionally created by the permanent affixing of border pieces at top of panel one and bottom of panel four coextensive with panel width and having 1¼ inch inner edge unaffixed to within border depth of panel sides and by the permanent affixing of border pieces along each visible portion of panel side height between top and bottom borders, all side border pieces having 1¼ inch unaffixed inner edges to within 1¼ inches of the border piece ends; all created slot pockets, both vertical and horizontal providing for the discretionary insertion of top, side, and bottom protrusions of the accompanying minimally detailed, identically sided show pieces and their differently sided, additionally horizontally slit background changes, storage for which is provided in the zip-closing envelope affixed to the reverse upper half of the Tell Board, which board further employs simple eyelet-secured hanging/carrying handles at center top and bottom ends.

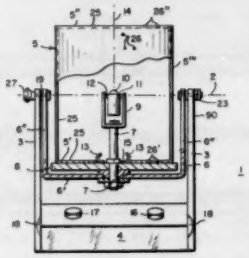
4,178,701

CYLINDRICAL PLANETARIUM PROJECTOR

Philip M. Sadler, 93 Hammond St., Cambridge, Mass. 02138

Filed Dec. 1, 1977, Ser. No. 856,252
Int. Cl.[2] G09B *27/00*
U.S. Cl. 35—42.5 **11 Claims**

1. A star projection device comprising,
an opaque film forming the surface of a nonspherical enclosure having a geometrical center and an axis of symmetry,
said enclosure being an assembly of pieces of originally flat film, which pieces of film are attached to each other near their edges to form said enclosure,
said film having transparent spots thereon whose positions and areas are representative of the true positions and brightness of selected stars when projected onto a viewing surface,
a point source of light positioned at the center of said enclosure,
a gimbal,
an enclosure support means attached to said gimbal,
means for attaching said enclosure to said support means to



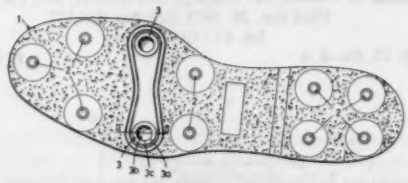
allow the enclosure's axis of symmetry to be tilted with respect to the vertical in response to positioning of said gimbal while maintaining the light source at the center of said enclosure,
said enclosure support means also being adapted to allow said enclosure to be rotated about its axis of symmetry while being supported by said support means,
whereby light projected through said spots and impinging on said viewing surface spaced from said light source provides a true representation of the star pattern as seen from a point on the Earth at a selected time corresponding to the selected tilt and rotation angle of said enclosure.

4,178,702

GOLF-SHOE SOLE

Hubert J. M. Mayer, Marly, Switzerland, assignor to Bata-Schuh-Aktiengesellschaft, Riburg, Switzerland

Filed Dec. 20, 1977, Ser. No. 862,394
Claims priority, application Switzerland, Dec. 22, 1976, 16190/76
Int. Cl.[2] A43C *15/02*; A43B *5/00*
U.S. Cl. 36—59 R **3 Claims**



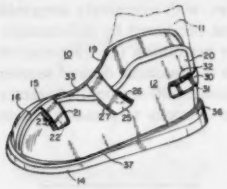
1. In a golf-shoe sole of the type made of polyurethane-base foamed material and having spikes, the improvement comprising:
a spike-free transverse zone situated at a location intended to be occupied by the ball of a wearer's foot, and
two or more volcano-shaped elevations disposed in said zone, each of said elevations having a base, a conical outer surface, and a cup-shaped central depression, the apex angle of said conical outer surface being approximately 90°, and said outer surface intersecting with the surface of said depression to form a circular rim from 10 to 12 mm in diameter situated approximately 3 mm below said base.

4,178,703

SHOE TO BE WORN OVER CAST

Sidney Pols, c/o E. J. Sabel & Co., Benson E. Bldg., P.O. Box 644, Jenkintown, Pa. 19046

Filed May 24, 1978, Ser. No. 909,016
Int. Cl.[2] A43B *21/00*
U.S. Cl. 36—110 4 Claims



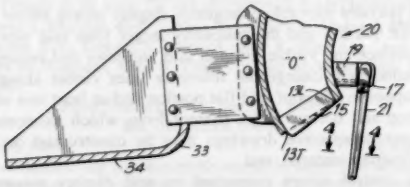
1. A shoe to be worn over a cast which comprises
an upper which is adapted to fit around the lower portion of a cast which has a toe and heel portion, the upper including
a pair of side halves detachably secured around the cast by a plurality of straps,
a sole attached to said upper,
said upper side halves meeting at the front and back of said sole,
a heel wedge portion associated with said sole which imparts a lift to the heel portion of the cast,
said straps being attached to one of said upper halves,
said straps comprising a rear strap horizontally disposed for restraining relative movement between the cast and the sole, and
spaced forwardly disposed straps for restraining relative movement between the cast and the sole,
said straps having strips of thistle cloth attached thereto for adjustable engagement with strips of complemental thistle cloth attached to said other of said halves.

4,178,704

SUCTION NOZZLE DREDGE HEAD

John P. Latimer; Robert M. Donaldson; Ted W. Christian, and Glen E. Miller, all of Newport News, Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Nov. 1, 1977, Ser. No. 847,482
Int. Cl.[2] E02F *3/94*
U.S. Cl. 37—57 17 Claims



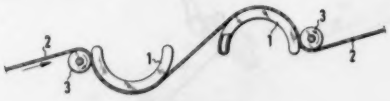
1. A suction nozzle assembly, adapted for gathering objects from the ocean floor, the nozzle assembly comprising a nozzle having nozzle edges framing a nozzle opening at a first end of the nozzle, a plurality of relatively slender, elongated fingers resiliently, pivotally connected adjacent a first edge of the nozzle opening, movement-limiting means permitting pivotal movement of at least a portion of the fingers from a first, extended position to a second pivoted position, wherein the fingers are juxtaposed across the nozzle opening so as to interfere with the passage of material into the nozzle opening, the elongated fingers being biased towards the first position, the fingers in the first position extending beyond a second, opposite edge of the first end of the nozzle.

4,178,705

PROCESS FOR THE REDUCTION OF THE FROSTING EFFECT IN DYEING OF TEXTILE FABRICS

Walter Birke; Hans-Ulrich von der Eltz, and Franz Schön, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,378
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2637303
Int. Cl.[2] D06B *3/10;* D06F *69/00;* D06P *5/20*
U.S. Cl. 38—144 8 Claims



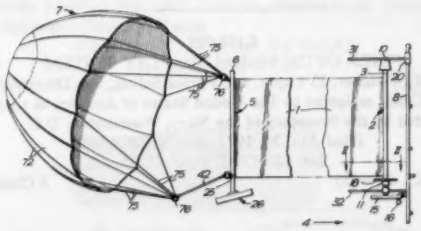
1. In a continuous process for uniform dyeing a web of textile material containing staple fibres of polyester or spun rayon, which process comprises dyeing, intermediate drying and dyestuff fixation steps, the improvement which comprises: applying pressure against a surface of the said textile material after said material has been dyed but prior to intermediate drying, whereby fiber ends protruding from the said surface are caused to adhere to said surface, and thereby uniformly dyeing each fiber in the material.

4,178,706

VEHICLE TOWED DISPLAY DEVICE

Robert A. L. Boyce, Ashwell Farm, Halwell, Totnes, Devon, England

Filed Jun. 8, 1977, Ser. No. 804,636
Int. Cl.[2] G09F *3/00*
U.S. Cl. 40—326 26 Claims



1. A display device for towing behind a vehicle, comprising:
a banner having a leading edge, a trailing edge and two longitudinal edges;
leading edge attachment means for attachment of said leading edge of the banner to said vehicle, including a roller on which the banner may be wound when not in use and support means adapted to be mounted on the vehicle to support the roller above the surface over which the vehicle moves, for rotation about its longitudinal axis with said axis substantially vertical;
a stay attached to said trailing edge of said banner at positions adjacent said longitudinal edges thereof to maintain said trailing edge extended, in use;
aerodynamically stable drogue means comprising an open-ended, flexible sleeve having a leading end and a trailing end, and
means connecting said leading end of said drogue means to said stay such that the upper portion, in use of said device, of said leading end is closer to said stay than the lower portion of said leading end,
said drogue means providing sufficient lift and drag to main-

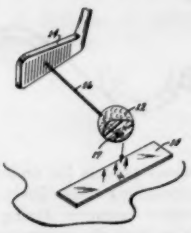
tain said towed banner in a substantially vertical plane with its longitudinal axis substantially horizontal.

4,178,707

DISPLAY APPARATUS UTILIZING MAGNETIC MATERIALS

John V. Littlefield, Box 69507, Los Angeles, Calif. 90069

Filed Jul. 18, 1977, Ser. No. 816,298
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—426 **12 Claims**



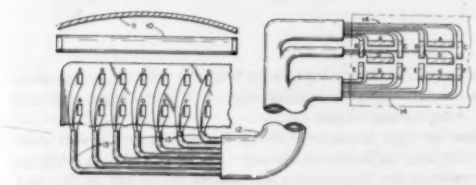
1. A display apparatus for maintaining an object in an apparently unsupported position, the apparatus including a sheet-like body of magnetic material having a continuous flat surface area, the material being magnetized in such a way that the entire surface area is of the same polarity, an object being magnetized in a region of less lateral extent than said area and adapted to be maintained in a position spaced from said surface, said object being polarized such as to be acted on by repulsive magnetic force of said material and gravity, means including a tether attached to said object for restraining it, the tether having a position in relation to the dimensions of said piece of material that the object is normally held in a stabilized position whereby if the object is displaced laterally with respect to said surface it will return to said stable position.

4,178,708

FIBER OPTIC VISUAL DISPLAY SYSTEM

Paul C. Fletcher, El Cajon, and Parviz Soltan, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 809,146
Int. Cl.[2] G09F *9/32, 13/18*
U.S. Cl. 40—451 **3 Claims**



1. A low cost fiber optic visual display system having the capability to be rapidly updated comprising:

a source of light energy;

a plurality of fiber optic cables having first terminal ends disposed to transmit light energy from said source to second terminal ends arranged in a multiple character alpha-numeric display plane, each character being definable within a uniform multi-segment format such as seven segments arranged in a double rectangular configuration;

discrete groups of said fiber optic cables having their first terminal ends disposed in juxtaposed columns and juxtaposed rows of separate aperture areas spatially positioned contiguous to said source of light energy;

second terminal ends of said discrete groups of fiber optic cables arranged in said display plane for separately defining each segment of each character in said uniform multi-segment format; and

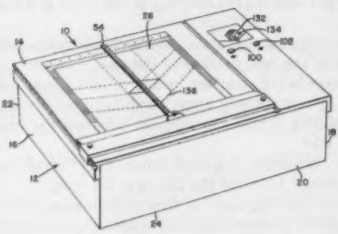
a computer produced punched card adapted to be rapidly and completely inserted between said first terminal ends and said source of light energy, and having columns and rows of aperture areas corresponding to said separate aperture areas, with selectively determined punched out aperture areas produced by information developed in a computer for permitting the transmission of light energy therethrough to illuminate desired segments of characters in said uniform multi-segment character format in said display plane whereby to visually present alpha-numeric information.

4,178,709

MACHINE FOR USE IN PICTORIAL DRAFTING

Alan T. Ford, P.O. Box 531, Green Harbor, Mass. 02041, and Norman G. Graf, 255 High St., Hingham, Mass. 02043

Filed Jul. 6, 1976, Ser. No. 702,674
Int. Cl.[2] G09F *11/18*
U.S. Cl. 40—471 **15 Claims**



1. Apparatus for use in making axonometric and perspective drawings, comprising

(a) a support including a generally rectangular flat portion providing a working surface to receive a generally rectangular stratum of drafting material placed thereon,

(b) a narrow elongated window located along the opposite side edges of said flat portion, and at least one of the top and bottom edges thereof beyond the edges of the drafting material and said working surface,

(c) laterally movable changeable display means below said flat portion and dimensionally larger than said working surface and visible through said windows and presenting selectively changeable reference lines visible along the opposite edges of said flat portion and at least one of the top and bottom edges thereof from which axonometric and perspective drawings may be constructed on said drafting material, and

(d) control means connected to said display means for changing said lines with respect to said material by laterally shifting said display means,

(e) said reference lines including side reference lines along the side edges of said flat portion and scale reference lines at least along one of the top and bottom edges of said flat portion,

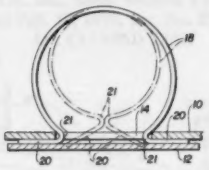
(f) said side reference lines providing reference indicia for drawing on the drafting material lines to a projected vanishing point when constructing perspective views and parallel lines when constructing axonometric views, on said drafting material and said scale reference lines providing spacing indicia for the dimensions in said perspective views that are being progressively foreshortened along the sides of said perspective views towards a vanishing point.

4,178,710

FLIP LEAF EXHIBITOR HAVING SEPARABLE RING FASTENERS FOR LEAVES

Hans F. Schmid, Verona, N.J., assignor to Mar-Kal Products Corporation, Montclair, N.J.

Filed Nov. 28, 1977, Ser. No. 855,217
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—530 2 Claims



1. A changeable exhibitor comprising a substantially flat base plate having plural spaced rectangular slots formed therethrough centrally of the base plate in a row across the base plate, a comparatively narrow elongated flat backbone strip underlying the base plate adjacent to said row of rectangular slots and covering said slots, means fixedly securing opposite end portions only of the backbone strip to the base plate with the main body portion of the backbone strip adjacent to said rectangular slots unattached to the base plate, plural independently operable separately formed retainer rings formed of flat spring strip stock and corresponding in number to said rectangular slots, said retainer rings being identical and each including a major circumference body portion having opposite end abrupt elbows and a pair of oppositely extending flat terminals projecting outwardly of the elbows in a common plane generally tangentially to the body portion, said terminals of each retainer ring being resiliently biased toward separated positions, and said retainer rings being manually contractable to allow said terminals to enter and pass through said rectangular slots of the base plate and to then pass between the base plate and the unattached body portion of said backbone strip with said elbows engaging opposite ends of said rectangular slots when the retainer rings are allowed to expand, and plural flip leaves bearing indicia components and having openings near corresponding edges thereof receiving the body portions of the retainer rings.

4,178,711

METHOD FOR USE IN HARVESTING EARTHWORMS

Howard J. Mermal, 4045 S. Pine Ave.; Gary A. Mermal, 4060 S. Taylor Ave.; Donald J. Mermal, 4409 S. Pine Ave., and Robert M. Mermal, 4045 S. Pine Ave., all of Milwaukee, Wis. 53207

Filed Dec. 22, 1977, Ser. No. 863,571
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—1 4 Claims

1. A method for causing earthworms to come out of soil so that they can be conveniently harvested, the method comprising the steps of forming a liquid composition achieved by mixing husks of walnuts and water and applying said liquid composition to an area of surface of the ground.

4,178,712

LIGHT APPARATUS FOR FISHING ROD

Chalmer Williams, Rte. 3, Dry Ridge, Ky. 41035

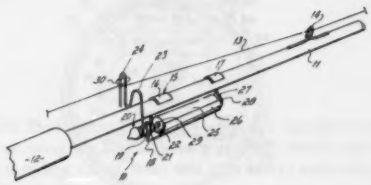
Filed Nov. 3, 1977, Ser. No. 848,209
Int. Cl.[2] A01K *91/06*
U.S. Cl. 43—17 10 Claims

1. Line-actuated light apparatus for a fishing rod comprising:

a bracket including means for releasably attaching the bracket to a fishing rod, means for releasably holding a battery therein, and means at one end of said bracket for operatively contacting one terminal of a battery placed in said releasable battery holding means,

a yieldable trigger arm attached at one end to another end of said bracket and having a fishing line engageable trigger finger at another end of said arm, said arm further comprising a bulb socket operatively and movably disposed in relation to another terminal of a battery in said releasable battery holding means,

said means for operatively contacting said one terminal of a battery being electrically connected to said bulb socket; and



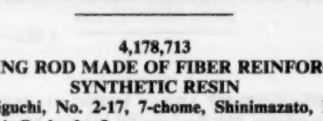
wherein said trigger arm includes two trigger fingers formed therein proximate said other end thereof, a first trigger finger comprising a bend in said arm and having a first bend radius, and a second trigger finger comprising a bend in said arm having a lesser bend radius than the first bend radius, said fingers being formed one after the other in said trigger arm and said fingers extending outwardly of said bracket to a position for engagement with a loop in a fishing line when said bracket is mounted on a fishing rod, said finger being disengageable from said line in response to a predetermined tension exerted on said line.

4,178,713

FISHING ROD MADE OF FIBER REINFORCED SYNTHETIC RESIN

Kenichi Higuchi, No. 2-17, 7-chome, Shinimazato, Ikuno-ku, Osaka-shi, Osaka-fu, Japan

Filed Oct. 17, 1977, Ser. No. 842,871
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—18 GF 5 Claims



1. A tubular fishing rod having a circular cross-section and comprising an inner layer formed of a woven cloth; a space retaining layer formed of woven cloth which has relatively large interstices, large thickness and small weight per unit area over said inner layer; an intermediate layer formed of fibers longitudinally unidirectionally oriented over said space retaining layer; an outermost layer formed of a woven cloth; and a cured synthetic resin binding the cloth and fibers to form a unitary solid mass.

4,178,714

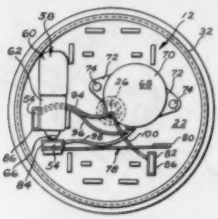
LIGHTED AND SOUNDING TOY

John B. Tsen, and Fan B. Tsen, both of 7700 Clark La., Manlius, N.Y. 13104

Filed Jun. 28, 1978, Ser. No. 920,010
Int. Cl.[2] H01H *35/02;* A63H *33/26, 27/12*
U.S. Cl. 46—228 9 Claims

1. A lighted yo-yo comprising a pair of hollow shell sections each having a removable cover and formed of translucent material and joined together by an axle portion to define a

central groove for receiving an elongated string that is attached to the axle portion, and lighting means to produce a source of light for each shell section, said lighting means comprising heavy duty battery means in one shell section and a lamp in each shell section, and electrical conductors connecting the battery means to the lamps, and centrifugal switch means in one conductor whereby when the yo-yo is rotating the switch will be biased closed to energize the lamps; the invention comprising locating the battery means in a first shell



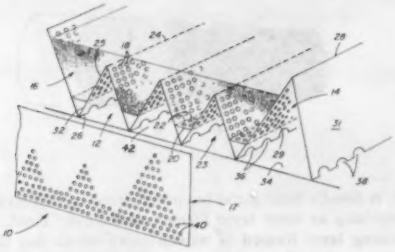
section with its central portion adjacent the central axis of the axle portion, while the second shell section is provided with a light weight audible electrical signal device that is electrically connected in the lighting means circuit to function simultaneously with the lamps, the relative heavy weight of the battery means versus the light weight of the audible signal device creating an unbalanced condition, whereby the heavy side dominates the light side and controls the rotational stability of the yo-yo.

4,178,715

CHANNEL CULTURE ARRAY USING SALINE WATER

George Greenbaum, 790 Boylston St., Boston, Mass. 02199

Filed Jul. 26, 1978, Ser. No. 928,150
Int. Cl.[2] A01G *9/02, 1/00*
U.S. Cl. 47—58 18 Claims



1. A channel culture array which is received on a base over which contaminated water flows comprising:

a fluid permeable floor,

walls extending upwardly from the floor and defining with the floor a cavity to contain soil,

means joined to the floor

to support the floor and engage the base,

to maintain the floor spaced apart from the contaminated liquid, and

to prevent contact of the soil with the liquid,

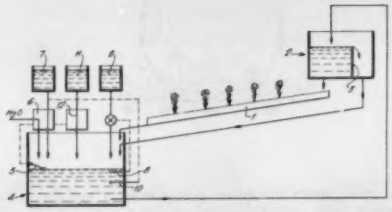
the undersurface of the floor, said means and the surface of the water defining a zone which is at a temperature lower than the ambient temperature outside of the zone whereby the moisture in the vapor phase in the zone condenses, coalesces on the underside of the floor and wets the soil.

4,178,716

NUTRIENT FILM TECHNIQUE

Douglas C. Harper, and Derek C. Attenburrow, both of Ipswich, England, assignors to Fisons Limited, Suffolk, England

Filed Jan. 11, 1978, Ser. No. 868,505
Claims priority, application United Kingdom, Jan. 15, 1977, 1636/77; Aug. 26, 1977, 35976/77
Int. Cl.[2] A01G *31/00*
U.S. Cl. 147—62 13 Claims



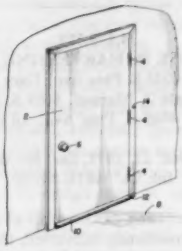
1. In the method of propagating plants wherein the roots of the plants are at least partially immersed in a circulating aqueous solution containing plant nutrient salts which are consumable by the plants, the water and the nutrient salts which are consumed by the plants being replenished by feeding to the circulating solution water and a mixture of nutrient salts having a major proportion of main nutrient salts which are consumable and a minor proportion of non-nutrient salts which are not consumable by said plants, the improvement wherein said mixture of consumable and non-consumable salts is fed to said circulating solution in a proportion such that the concentration of consumable salts in said solution is maintained at a predetermined excess over the concentration of non-consumable salts, whereby the useful life of said solution is increased.

4,178,717

DEVICE FOR SEALING THE GAP UNDER A DOOR

Wallace S. Sakauye, 1333 Heulu St. Apt. #604, Honolulu, Hi. 96822

Filed Apr. 13, 1978, Ser. No. 896,064
Int. Cl.[2] E06B *7/00, 7/16*
U.S. Cl. 49—70 5 Claims



1. In combination, a hinged door and a device for sealing the gap under a hinged door, said door having a vertical face and a bottom surface with a gap therebeneath, said device including an elongated member unconnected to the door and having a length approximately equal to the door width, said elongated member having a base portion extending beneath the bottom surface of the door for resting on the floor, said base portion including a forward tip portion inserted under the door and obstructing substantially the entire gap under the door, said elongated member having an elongated sealing flange spaced from said tip portion and having a lower surface which extends from the base portion at an upward and forward inclination,

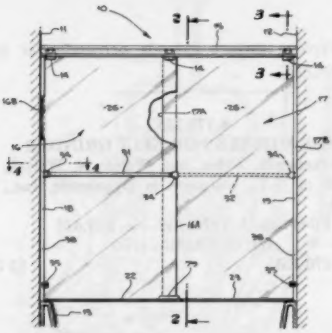
said sealing flange having at its upper end a sealing surface in contact with the door face.

4,178,718

DOOR ASSEMBLY FOR A TUB AND SHOWER ENCLOSURE

Jordan M. Laby, Sherman Oaks, Calif., assignor to American Shower Door Co., Inc., Santa Monica, Calif.

Filed Feb. 10, 1978, Ser. No. 876,646
Int. Cl.² E05D *13/02*
U.S. Cl. 49—411 **2 Claims**



1. A sliding door assembly for use with top and bottom horizontal guide tracks extending between spaced vertical uprights and comprising at least one unpierced movable door panel defined by four edges and obverse and reverse faces; a door panel support roller engaging the top guide track, clamp means securing a support roller to the door panel, a central bottom track panel guide, means securing said bottom track panel guide to the bottom track centrally thereof; a horizontal article holder on said movable panel comprised of a pair of spaced holder ends, a bar extending between said holder ends spaced from a face of said door panel, each of said holder ends having parallel mounting flanges on each face of said door panel; a binding laminate comprising a plastic sheet, an adhesive on obverse and reverse faces of said sheet, and protruding shoulders on each of the upper and lower peripheries of said sheet, said shoulders contacting said mounting flanges in support relationship thereto; said binding laminate intervening between said flanges and said door panel faces and compressed therebetween because of the small dimensional difference between panel thickness and flange separations.

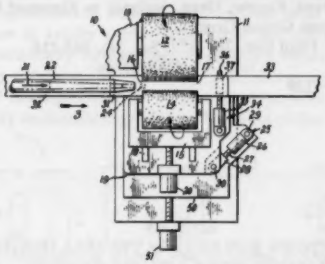
4,178,719

CENTERLESS GRINDING MACHINE

Wilbur F. Jessup, The Hague, Netherlands, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 20, 1978, Ser. No. 926,316
Int. Cl.² B24B *5/18*
U.S. Cl. 51—103 TF **5 Claims**

1. A centerless grinder, comprising in combination:
(a) a base;
(b) a grinding wheel, rotatably journaled in a grinding wheelhead on said base;
(c) a regulating wheel, rotatably journaled in a regulating wheelhead on said base and disposed relative to said grinding wheel so as to form an inlet end and an outlet end between said wheels;
(d) a work support located between said wheels, adapted to support a workpiece of revolution;
(e) a pivot joint proximate to said inlet end;
(f) means to pivot one of said regulating wheel and said grinding wheel relative to the other, about said pivot joint, while grinding;
(g) means to axially move said workpiece relative to said wheels while grinding; and



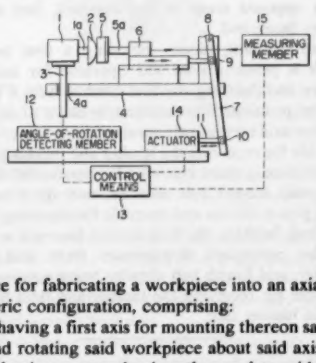
(h) pivot feed means operable to achieve variable feed distances along the face of said regulating wheel relative to said grinding wheel, from said inlet end to said outlet end, while grinding.

4,178,720

DEVICE FOR FABRICATING AXIALLY SYMMETRIC ASPHERICS

Hiroshi Hashimoto, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 25, 1978, Ser. No. 872,032
Claims priority, application Japan, Jan. 27, 1977, 52-7231
Int. Cl.² B24B *13/00*
U.S. Cl. 51—124 L **7 Claims**

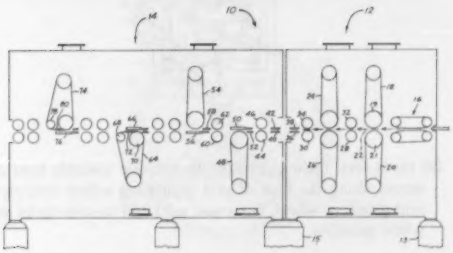


1. A device for fabricating a workpiece into an axially symmetric aspheric configuration, comprising:
(a) means having a first axis for mounting thereon said workpiece and rotating said workpiece about said axis;
(b) means having a second axis orthogonal to said first axis and for swinging said first axis so that said workpiece is swung within a predetermined angle about said second axis;
(c) means for detecting the angle of swing of said workpiece about said second axis;
(d) means for grinding said workpiece;
(e) drive means for displacing said grinding means in a direction orthogonal to said second axis within a range permitting the grinding;
(f) means for measuring the grinding position of said grinding means; and
(g) means coupled to said detecting means and said measuring means for pre-memorizing, in accordance with said angle of swing, a predetermined position of each point on the aspheric configuration to be ground and for controlling said drive means so that said grinding position measured by said measuring means is equal to said memorized predetermined position.

4,178,721
APPARATUS FOR SIZING AND FINISHING BATCHES OF LUMBER

F. David Evans, Eugene, Oreg., assignor to Kimwood Corporation, Cottage Grove, Oreg.

Filed Dec. 28, 1977, Ser. No. 865,218
Int. Cl.[2] B24B *21/04*
U.S. Cl. 51—139 3 Claims



1. Apparatus for sizing and finishing lumber comprising:

sizing means including a first pair of opposed, powerdriven belt abraders operable for receiving and dimensionally sizing the lumber to a first predetermined thickness by simultaneously abrading directly opposed areas on opposed, first and second lumber faces and conveying the lumber downstream and a second pair of opposed, powerdriven belt abraders positioned downstream from said first pair of opposed belt abraders, said second pair being operable for receiving and dimensionally sizing the lumber, conveyed from said first pair of belt abraders, to a second predetermined thickness by simultaneously abrading directly opposed areas on the opposed, first and second lumber faces; and

staggered finishing means including a first belt abrader which is power-driven and operable for receiving the lumber and finishing the first lumber face, a second belt abrader positioned downstream relative to said first belt abrader, said second belt abrader being power-driven and operable for receiving the lumber and finishing the second lumber face, a third belt abrader positioned downstream from said second belt abrader, said third belt abrader being power-driven and operable for receiving the lumber and final finishing the first lumber face and a fourth belt abrader positioned downstream from said third belt abrader, said fourth belt abrader being power-driven and operable for receiving the lumber and final finishing the second lumber face.

4,178,722
GRINDING AND POLISHING TOOL

Donald B. Forman, and Gary M. Holma, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 18, 1978, Ser. No. 870,387
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—170 T 9 Claims

1. A grinding tool comprising:

a disc member having at least one flat circular abrasive band;

means for rotatably driving said disc member about an axis;

means for supporting an elongate workpiece having a longitudinal axis in a perpendicular relationship with respect to said abrasive surface and in oscillatory movement with respect to said abrasive surface in an arc having a radius greater than the radius of said disc member, said axis of the disc member lying between the axis of the supporting means and the workpiece;

means for locking the workpiece in the supporting means;

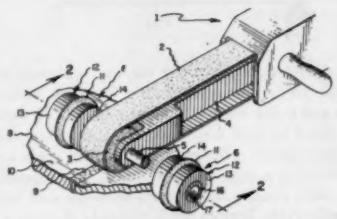
whereby during the grinding operation the abrasive scratch marks on said workpiece surface overlap to improve the smoothness and flatness of the workpiece surface and said

flat workpiece surface extends perpendicular to said workpiece axis.

4,178,723
GUIDE WHEELS FOR BELT GRINDER

Elwin H. Fleckenstein, Alden, and Walter N. Welsch, Tonawanda, both of N.Y., assignors to Dynabrade, Inc., Tonawanda, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,425
Int. Cl.[2] B24B *23/06*
U.S. Cl. 51—170 EB 12 Claims



1. A guide for an endless belt abrading device (1) of the type having an endless abrasive belt (2) trained over a contact wheel (3), said contact wheel (3) providing support for said belt (2) at the point of contact between said belt (2) and a workpiece (8), said contact wheel (3) being supported by a laterally extending axle (5) which is in turn supported by a contact arm (4) extending outwardly from a motor unit which drives said belt, characterized in that:

said guide includes a laterally disposed guide wheel (6) rotationally disposed on the lateral extension of said axle (5), said guide wheel (6) including a circumferentially round continuous guide ring (11) and means for adjustably varying the radius of said guide ring (11) continuously of its circumference to compensate for variations of the combined radius of said contact wheel (3) and the thickness of said abrasive belt (2).

4,178,724
RAIL GRINDING SYSTEM

Anthony T. Bruno, East Syracuse, N.Y., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Mar. 23, 1978, Ser. No. 889,289
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 26 Claims

1. A rail grinding unit for grinding the running surface of a railroad track comprising:

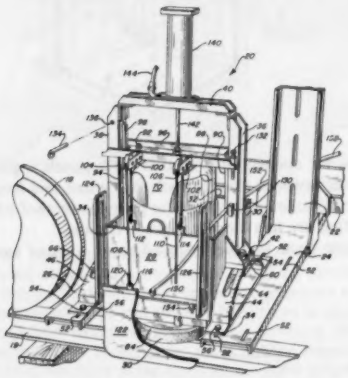
(a) a support frame mounted on said railroad track and extending over the track surface to be ground;

(b) a housing structure upstandingly-supported on said support frame over, and in spaced relation from, the track surface to be ground, said housing structure being adjustably movable on said support frame transverse to said track over a predetermined arc generally centered about said track;

(c) motor means telescopically disposed and reciprocally movable with respect to said housing structure, said motor means having a rotatable shaft downwardly disposed toward said track;

(d) a grinding wheel mounted concentrically on said rotatable shaft and having a working surface disposed to contact the running surface of said track when said motor means is gravitationally advanced toward the same; and

(e) a single piston-cylinder assembly controlling the reciprocal movement of said motor means with respect to said housing structure and the force with which the working surface of said grinding wheel contacts the running surface by counter-



balancing gravitational forces, said single piston-cylinder assembly being disposed upwardly of said motor means and operatively affixed to said housing structure and said motor means with the center line of said piston-cylinder assembly aligned with the center of rotation of said motor means and said grinding wheel throughout the reciprocal movement of said motor means;

said grinding wheel thereby being movable throughout said predetermined arc and reciprocally movable relative to the surface to be ground whereby the working surface of said grinding wheel is contactable with any selected areas of the running surface to be ground.

4,178,725

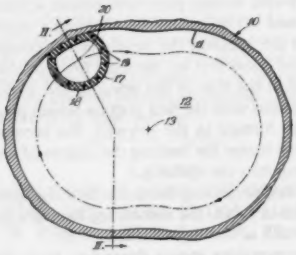
ROTARY ENGINE HOUSING MANUFACTURE

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 611,100, Sep. 8, 1975, abandoned. This application Apr. 17, 1978, Ser. No. 897,636

Int. Cl.[2] B24B *1/00;* **B24D** *11/00*

U.S. Cl. 51—290 **9 Claims**



1. The method of finishing a rotary internal combustion engine inner wall surface, comprising

honing said wall surface to define a crosshatched topography wherein unfilled cross-hatching lines are provided at a substantial angle to the line of intersection of a transverse plane with said wall surface, said honing step being effected by a flexible cylindrical hone having rigid longitudinal reinforcing stays arranged in a coaxially annular array about the axis of the cylindrical hone whereby the hone is axially substantially rigid and circumferentially substantially flexible, said hone being rotated about said axis and concurrently oscillated parallel to said axis during the honing operation to provide a preselected substantially uniformly angled cross-hatching of the wall surface.

4,178,726

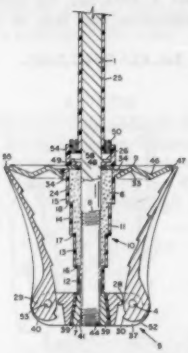
METHOD AND APPARATUS FOR PROTECTING THREAD ON AN EARTH ANCHOR

Gary Q. Watson, P.O. Box 1374, Del Rio, Tex. 78840

Filed Aug. 8, 1978, Ser. No. 931,941

Int. Cl.[2] E02D *5/74*

U.S. Cl. 52—98 **16 Claims**



1. An earth anchor adapted for attachment to a cable that pulls in a first direction generally parallel to a longitudinal axis of said earth anchor upon installation in the earth, said earth anchor comprising:

a rod extending along said longitudinal axis of said earth anchor, an upper end of said rod having means for attachment to said cable;

an anchor nut threadably attached to a lower end of said rod;

wing means pivotably attached to said nut means;

plate means retained on said rod and spaced above said anchor nut, said plate means being generally perpendicular to said longitudinal axis;

collapsible cylinder means located concentrically about said rod and abutting said plate means and said anchor nut on opposite ends thereof; and

insulating means about said rod for insulating said rod above said anchor nut from the earth, some of said insulating means being a pliable substance contained inside of said collapsible cylinder means.

4,178,727

HEAT ABSORBING PANEL

Richard C. Prusinski, Dearborn, Mich., and Timothy E. Johnson, Newton Center, Mass., assignors to Architectural Research Corporation, Livonia, Mich.

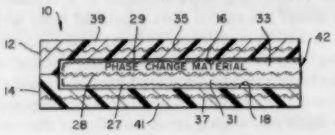
Filed Feb. 1, 1978, Ser. No. 874,117

Int. Cl.[2] F24D *5/10;* **E04B** *1/76*

U.S. Cl. 52—173 R **16 Claims**

1. A rigid heat absorbing panel comprising an outer casing of

resinous material, a central core within said casing including at least one water-tight capsule, and a substantial amount of phase

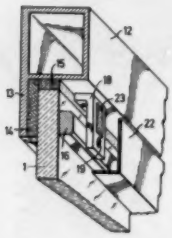


change material having a melting point in the range of normal room temperature in said water-tight capsule.

4,178,728
FIRE-PROOF WINDOW

Gunther Ortmanns; Franz Kraemling, both of Aachen, and Siegfried Pikhard, Roetgen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 5, 1977, Ser. No. 857,417
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654776
Int. Cl.² E04C *2/00*
U.S. Cl. 52—232 **12 Claims**



1. In a fire-resistant window having at least one glass sheet normal in a main frame disposed about the peripheral edge of the glass sheet with the edge region of the sheet on the side thereof to be exposed to the heating effect of fire being at least partially exposed and free of frame structure, the improvement comprising:

(a) means disposed along the peripheral edge of the glass sheet for securing said sheet to the main frame, said means being disposed to leave the edge region of the sheet sufficiently exposed so that no stresses causing rupture of the glass will occur when the glass sheet is subjected to the heating effect of fire;

(b) listel means disposed over said edge region;

(c) connection means for attaching said listel means to either or both of said glass sheet or frame; and

(d) said listel means or connection means or both being constructed of material which in response to the heat of fire changes its physical properties to remove said listel means from said edge region.

4,178,729
WALL STRUCTURE FOR A NUCLEAR REACTOR CONTAINMENT HOUSING

Ralph L. Jennings, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

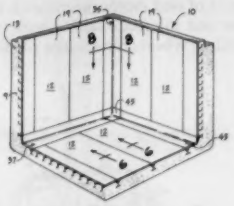
Filed May 15, 1978, Ser. No. 905,643
Int. Cl.² E04B *1/70*
U.S. Cl. 52—284 **5 Claims**

1. A wall structure for a nuclear reactor containment housing comprising:

(a) at least two metal concrete form panels each of which include:

(1) a rectangularly shaped main plate having side edges and end edges,

(2) a laterally extended flange about the periphery of said main plate, said flange having an outer portion and an inwardly inclined inner leg portion connected with said main plate inwardly from the side edges and end edges thereof,



(b) means for connecting said two form panels together at the outer portions thereof such that when said forms are connected together at the outer portions thereof adjacent side edges are in a closely spaced relation,

(c) a liquid tight seal between adjacent ones of said side edges.

4,178,730
DRY WALL REPAIR KIT

Anthony S. Rowinski, 2635 Rambling Way, Bloomfield Hills, Mich. 48013

Filed Jun. 6, 1977, Ser. No. 803,742
Int. Cl.² E02D *37/00*; E04G *23/00*
U.S. Cl. 52—514 **5 Claims**

1. In a drywall repair device which is inserted into the periphery of a drywall, having paper and plaster sections, about an opening formed in the drywall for enabling a repair plug to be inserted into the opening, the improvement comprising:

(a) an extended linear first leg having a first portion abutting the drywall at the rear of the opening and a second portion, continuous with the first portion which projects into the opening formed in the drywall, the second portion defining stop means for limiting the degree of insertion of a repair plug into the opening,

(b) a second leg projecting from the first leg spanning the width of the drywall, the second leg having a length less than the width of the drywall, and

(c) drywall penetrating means depending from the second leg which are inserted into the drywall between the paper and plaster sections, about the opening for fixing the device in position, and

wherein the first portion cooperates with the second leg and penetrating means to define the sole means by which the device is supported on the drywall.

4,178,731
ROOF COVERING

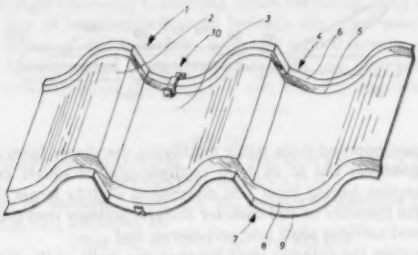
Bengt O. Petersson, Kungsbacka, Sweden, assignor to Bengt Petersson New Products Investment AB, Gothenburg, Sweden

Filed Nov. 18, 1977, Ser. No. 852,912

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 7708919

Int. Cl.² E04D *1/34*

U.S. Cl. 52—520 **1 Claim**



1. Roof covering comprising a number of surface covering sheet metal strips and a number of fastening elements to be fastened to a foundation structure and to grip over the respective sheet metal strips and thereby hold them in place against the foundation structure, said surface covering sheet metal strips being highly profiled into a wave shape extending in the longitudinal direction of the strips with a wave length which is of the same order as the width of each strip, said wave shape having raised portions and countersunk portions as seen from the intended upper side of the strip and bent edge portions extending along the longitudinal edges of the strip, one of said bent edge portions having a portion extending in outwardly direction from said upper side and preferably a subsequently following portion which is parallel to the principal surface of the strip, while the other edge portion has a portion extending in an opposite direction away from the principal surface and preferably is followed by a portion parallel to the principal surface, said edge portions being arranged to overlap each other when a number of strips are laid close to each other in order to form coverings, said fastening elements each being arranged with a first portion adapted to be secured to the foundation structure, a second U-shaped portion to grip over the underlying edge portion of the edge portions overlapping each other and with a third outer portion constructed to form a bending angle therein and adapted to grip over the following portion of the overlying edge portion of the edge portions overlapping each other after the mounting of the same by means of a downwards bending operation, said bending angle being positioned at a distance from the edge of said following portion of the overlying edge portion, and the fastening elements being arranged to cooperate with the edge portions of the strips at the countersunk portions of the strips, whereby said second portion of the fastening element fixes the underlying edge portion against movements in the transverse direction of the strips and forms a support for the overlying edge portion, and said position of the bending angle of said third portion of said fastening element permits movements of the strip at the edge of its overlying edge portion.

4,178,732
APPARATUS FOR CLOSING AND OPENING THE THREADED NECKS OF CONTAINERS

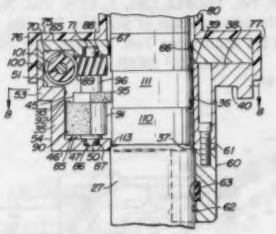
Frederick W. Pfleger, 1152 Barbara Dr., Cherry Hill, N.J. 08034

Filed Apr. 21, 1978, Ser. No. 898,825

Int. Cl.² B65B *7/28;* B67B *3/20*

U.S. Cl. 53—309 **13 Claims**

1. Apparatus for closing or opening the threaded neck of containers, said apparatus comprising a body having an open ended generally cylindrical passageway for receiving through one end a container neck, and a roller rotatably mounted in said body generally proximate to and projecting radially into said passageway for rolling engagement with a closure in said passageway, said roller having a reduced region for receiving



a closure during a limited angle of roller rotation and passing a closure into rolling relation with the roller upon continued roller rotation, said roller serving to frictionally rotate the passed closure to closed or open relation, respectively, upon oppositely directed rotation of the roller.

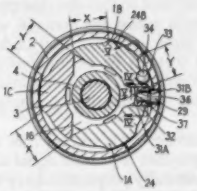
4,178,733
TORQUE OPEN CAPPING CHUCK IMPROVEMENT

Harry S. Dankert, Texas Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 3, 1978, Ser. No. 874,749

Int. Cl.² B67B *3/20;* B65B *7/28*

U.S. Cl. 53—331.5 **5 Claims**



1. In a chuck for a bottle capping machine, said chuck comprising:

an annular outer casing and torque means for accelerating and decelerating rotation thereof, a plurality of collet-type chuck jaws arranged within said outer casing and cooperable therewith for opening and closing in response to axial movement of said casing relative to said jaws, pin means extending from said casing and received between two of said jaws for transmitting thereto the rotation applied to said casing by said torque means, and means responsive to a predetermined resistance of said jaws to said rotation thereof by said casing for effecting axial movement of said casing, thereby causing opening of said jaws, the improvement comprising:

a bearing ball positioned rotatably on an outer face of that one of said jaws which receives an accelerating circumferential thrust from said pin means, said ball being near said pin means and bearing against the opposed surface of said casing for limiting the movement of that portion of said one jaw adjacent said ball toward said casing in response to an application of said circumferential thrust by said pin means to said one jaw.

4,178,734

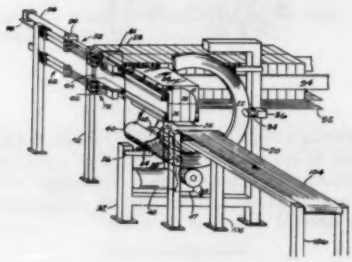
REVERSE WRAP

William G. Lancaster, 5101 Upper River Rd., Louisville, Ky. 40222, and Patrick R. Lancaster, 2906 N. Osage, Louisville, Ky. 40210

Division of Ser. No. 730,612, Oct. 7, 1976, Pat. No. 4,110,957, which is a continuation-in-part of Ser. No. 594,506, Jul. 9, 1975, abandoned. This application Feb. 3, 1978, Ser. No. 875,104

Int. Cl.[2] B65B *13/04*

U.S. Cl. 53—399 **8 Claims**



1. A process of making unitary packages from a plurality of loads of individual units by automatically wrapping the loads with a stretchable material having a width that is about the same width as the load length comprising the steps of:

a. transporting one of said loads to a wrapping apparatus;

b. withdrawing a leading edge of stretchable material from said wrapping apparatus and holding said leading edge in a film clamping assembly having a length that is at least equal to the width of said material in a fixed position adjacent to said load so that the clamping assembly clamps the film material across the material width;

c. placing said stretchable material under tension to cause said material web to be continuously and substantially stretched and wrapping said substantially stretched material around said load and film clamping assembly a plurality of times;

d. moving a member of a second film clamping assembly having a length that is at least equal to the width of said material substantially perpendicularly to the width of said material adjacent to said stretched material load overwrap and continuing the wrapping of stretched material around said load, said first film clamping assembly and past said second film clamp member;

e. stopping the wrapping of said stretched material around said load;

f. moving a second member of the second clamping assembly having a length equivalent to said first member substantially perpendicularly to the width of said material to clamp the web of stretched material between it and the first member and sever it from said wrapping apparatus;

g. releasing said leading edge of stretched material from said first film clamping assembly;

h. sliding the wrapped load off of the first film clamping assembly; and

i. transporting the wrapped load from the wrapping apparatus.

4,178,735

METHOD OF SHEATHING CATHETER

Knute D. Jackson, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

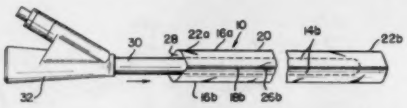
Filed Jul. 13, 1977, Ser. No. 815,120

Int. Cl.[2] A61M *25/00;* **B65B** *5/04*

U.S. Cl. 53—473 **4 Claims**

1. A method of covering an elongated limp cylindrical catheter shaft of generally uniform diameter with an elongated sleeve of non-rigid flexible plastic material having opposed first and second walls extending between a pair of opposed folds defining a generally flat configuration of the sleeve, and having a high coefficient of friction relative to the catheter shaft, comprising the steps of:

creasing said first and second walls along longitudinally extending first and second lines respectively located in said first and second walls generally centrally between



said opposed folds while modifying the sleeve from said generally flat to an open configuration of square cross section having inner side dimensions slightly larger than the diameter of said catheter shaft to facilitate insertion of said catheter shaft into said sleeve; and

inserting the catheter shaft between the walls of the sleeve while in said open configuration.

4,178,736

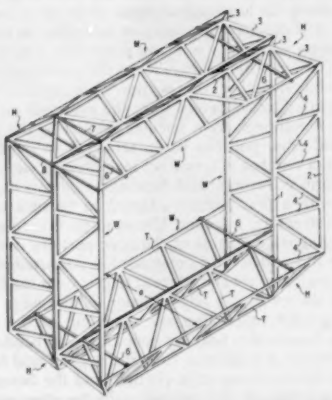
HOUSING MODULE AND SPACE FRAME

Frank D. Salas, 4200 Alhambra Cir., Coral Gables, Fla. 33146

Continuation-in-part of Ser. No. 655,504, Feb. 5, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,498

Int. Cl.[2] E04H *12/00*

U.S. Cl. 52—648 **22 Claims**



1. A rigid housing module formed of a plurality of module walls connected to one another at a predetermined angle other than 0° and 180°; the improvement wherein each module wall has

(a) an assembly of identical planar structural elements each having the shape of a trapezoid; each said element having a relatively long inner side constituting the long base of the trapezoid, a relatively short outer side constituting the short base of the trapezoid and two diagonal sides constituting the two non-parallel sides of the trapezoid; said inner and outer sides and said diagonal sides enclosing a quadrilateral area defining an element plane; the said inner sides of the elements in each said assembly lying in one plane constituting an inner assembly plane; the elements of each assembly being arranged in a juxtapositioned series wherein all said inner and outer sides are parallel to one another and wherein adjoining elements are connected to one another alternatingly along adjoining outer sides and along adjoining inner sides and further wherein said ele-

ments are in a zigzag arrangement and each said element plane is oriented at a predetermined oblique angle with respect to said inner assembly plane; adjoining module walls being connected to one another along adjoining, parallel-extending diagonal sides of the elements forming two said assemblies that constitute two adjoining module walls; each outer side and each inner side in any one said assembly continuing as an inner side and as an outer side, respectively, in any adjoining said assembly; and

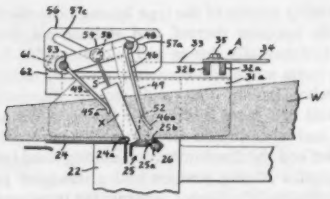
(b) rigid transverse connecting means extending along each line of intersection formed between the inner assembly planes of said assemblies; each said rigid transverse connecting means being attached to each said inner side it traverses along the respective said line of intersection.

4,178,737

WRAPPING MACHINE WITH IMPROVED ARTICLE DEPOSITING APPARATUS

Roger H. Stohlquist, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Jul. 10, 1978, Ser. No. 923,078
Int. Cl.[2] B65B *9/06, 39/14*
U.S. Cl. 53—550 **13 Claims**



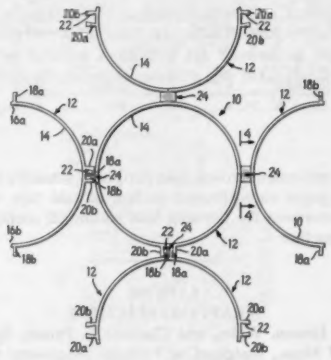
1. In a machine for wrapping elongate articles of the type having means for advancing a strip of wrapping material lengthwise in a forward direction along a generally horizontal path past an article loading station and wherein elongate articles are intermittently dropped endwise onto the strip of wrapping material at the loading station, article depositing apparatus above the strip at the loading station including a pair of lateral article guides and elongate forward and rear article guides, the lateral article guides being spaced apart in a direction crosswise of the path of advance of the strip to laterally position the article on the strip, forward and rear guide support means disposed above the lateral article guides and respectively supporting the elongate forward and rear article guides adjacent their upper ends, means mounting the forward and rear guide support means for movement from a rear position in which the forward and rear article guides extend downwardly between the lateral article guides respectively at the front and rear sides of the article loading station with their lower ends spaced apart a distance to laterally confine the elongate article against lengthwise turning when the article is dropped endwise therebetween onto the strip of wrapping material at the loading station; forwardly through an intermediate position in which the forward and rear article guides extend downwardly between the lateral article guides adjacent the forward side of the loading station with their lower ends spaced apart a distance to laterally confine the elongate article therebetween against lengthwise turning while tilting the elongate article forwardly; to a forward position in which the forward article guide has its lower end spaced from the rear article guide and from the article loading station a distance sufficient to allow the elongate article to fall forwardly on its side onto the strip of wrapping material, and means for moving the forward and rear guide support means through an article depositing cycle from a rear position forwardly through said intermediate position to said forward position and then back to said rear position.

4,178,738

MODULAR GRILLE

Edward C. Hallock; Robert Olsen, both of Summit, and George Ennesser, Cranford, all of N.J., assignors to Construction Specialties, Inc., Cranford, N.J.

Filed Apr. 12, 1978, Ser. No. 895,644
Int. Cl.[2] E04C *2/42*
U.S. Cl. 52—663 **12 Claims**



6. A grille comprising a multiplicity of pieces of uniform transverse cross section along their lengths, each piece having walls terminating in spaced-apart parallel edges defining a base plane of the piece that includes a medial longitudinal axis centered between the edges, an edge flange extending generally radially outwardly, relative to the longitudinal axis, from portions of the walls adjacent each edge, and a pair of closely-spaced parallel slot flanges extending generally radially outwardly, relative to the axis, from portions of the walls and defining an outwardly open slot centered on a medial plane of the piece that is perpendicular to the base plane and includes the longitudinal axis of the piece, the slot being spaced radially from the longitudinal axis of the piece a distance substantially equal to one-half the distance between the edge flanges, said pieces of the grille being placed together in opposite edge-to-edge relation in pairs to form closed cells having two pairs of opposed edge flanges and the cells being interconnected by reception of each pair of opposed edge flanges of each cell, other than those flanges at the perimeter of the grille, in a slot of a piece of each of a pair of adjacent cells that are located opposite each other adjacent said pairs of edge flanges, and the grille further comprising means for holding each pair of opposed edge flanges of each cell in tight frictional engagement with the slot flanges receiving them.

4,178,739

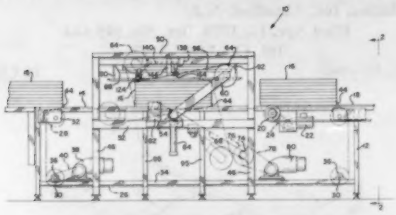
CONSTRUCTION FOR APPLYING TAPE

Warren Du Broff, Highland Park, Ill., assignor to Lathrop Paulson Company, Chicago, Ill.

Filed Feb. 1, 1978, Ser. No. 874,267
Int. Cl.[2] B65B *13/04*
U.S. Cl. 53—588 **11 Claims**

1. In a construction for applying tape around the perimeter of an object wherein a supply of tape is provided on a spool, support means are provided for the tape, and means are provided for transporting the spool and its support means around the periphery of the object, said tape being dispensed from the spool during its movement around the object whereby the tape is brought into engagement with said periphery, roller means including a single roller for engaging said tape, said roller means being movable over one surface of said object to press a section of tape into engagement with the surface, a roller means support, and drive means for said support, the improvement comprising means operating said drive means to drive said roller means across and beyond said one surface when

pressing a first tape section into engagement with said one surface, and means operating said drive means to drive said roller means back across said one surface after said spool com-



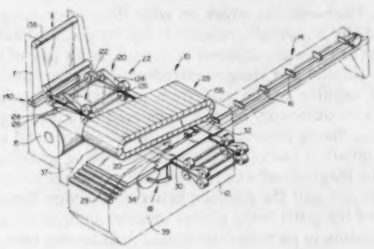
pletes its movement around said periphery whereby said roller means engages an additional section of said tape during its return movement for pressing said additional section against said one surface.

4,178,740

WRAPPING MACHINE

James S. Groom, Wales, and Clarence F. Prince, Springfield, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Jan. 23, 1978, Ser. No. 871,623
Int. Cl.[2] B65B *11/18*
U.S. Cl. 53—556 **12 Claims**



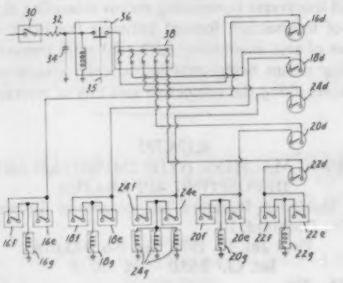
1. A machine for wrapping articles in stretchable wrapping material comprising folding mechanism including a pair of transversely extending first folding members, means for moving said folding members relative to each other between first and second positions, wrapper feeding means for positioning a stretchable wrapper in juxtaposition to said folding mechanism including transversely spaced longitudinally extending conveyor belts for engaging the wrapper along longitudinally extending opposite marginal portions thereof, holding means for releasably securing in fixed position opposing portions of the wrapper positioned by said feeding means, article moving means for receiving an article to be wrapped in one position and for moving the article toward the folding members and into stretching engagement with the wrapping material secured by said holding means and to another position beyond said folding members, and means defining a generally rectangular opening through which the article is constrained to pass when the article is moved from its one to its other position by said article moving means, said opening defining means comprising said feeding means and said first folding members in said first position, said conveyor belts defining longitudinally extending sides of said rectangular opening and said first folding members defining transversely extending sides of said rectangular opening, said holding means comprising means for releasably securing the longitudinally extending marginal portions of the wrapper to said conveyor belts and transversely extending portions of the wrapper to said first folding members.

4,178,741

SAFETY SYSTEM FOR RIDING MOWER

Dana R. Lonn, Minneapolis, and Melvin H. Jendersee, Apple Valley, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 17, 1978, Ser. No. 934,369
Int. Cl.[2] A01D *75/30*
U.S. Cl. 56—7 **5 Claims**



1. In a riding mower of the type having propulsion means, a seat for the operator thereof, and at least one cutting head which is hydraulically driven and is controllable between an operating norm and a non-operating norm by means of a hydraulic valve having first and second moveable spools, wherein said first spool is moveable between first and second positions, and wherein said second spool is moveable between first, second and third positions, said cutting head being moveable between a cutting position and a transport position by means of a hydraulic cylinder, wherein the improvement comprises:

(a) solenoid means adapted to move said first spool between said first and second positions;

(b) first electrical switch means actuatable by pressure in said seat and which is adapted to actuate said solenoid means;

(c) second electrical switch means actuatable by said hydraulic cylinder and which is adapted to actuate said solenoid means; and

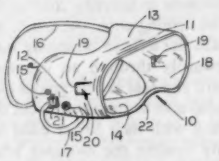
(d) third electrical switch means actuatable by movement of said second spool to said third position and which is adapted to actuate said solenoid means.

4,178,742

PROTECTIVE ANIMAL GOGGLES

Forrest E. Longfellow, 982 Young Ave., Barberton, Ohio 44203

Filed Nov. 7, 1977, Ser. No. 848,893
Int. Cl.[2] B68C *5/00*
U.S. Cl. 54—80 **4 Claims**



1. An eye protection device adaptable to mammalian, non-human animals, comprising:

a soft, flexible plastic envelope forming a goggle enclosure about the eyes, protecting the eyes of the animal from direct exposure to foreign objects and fumes; said envelope having a front, upper, lower, and two side portions, said upper, lower and said side portions extending rearward to comfortably conform to the angular anterior

cranial features of the particular mammalian, non-human animal; said front portion normal to said upper, lower, and side portions of said envelope;

said side portions having two elastic band means for securing said envelope to the cranium, one said band means extending around the posterior surface of the cranium and the other said band means extending around the mandible of the animal;

said side portions having venting means for permitting indirect exposure of the animal's eyes to the atmosphere; and

a shatterproof, plastic window positioned at said front portion of said envelope, said window normal to the line of sight by the eyes of the animal.

4,178,743

HARVESTER AIR SEPARATOR

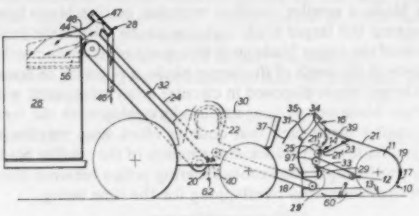
Gustaaf M. Persoons, Schoten, Belgium, and Corneel C. Wijts, San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 14, 1976, Ser. No. 686,604

Claims priority, application United Kingdom, Jul. 4, 1975, 28169/75

Int. Cl.[2] A01D *45/22*

U.S. Cl. 56—12.9 **10 Claims**



1. A cleaning stage of a harvester for beans and the like comprising a casing; a bean picking reel and a conveyor for receiving and conveying the beans, leaves and vine fragments picked by said reel; said casing being formed with an arcuate portion shrouding the upper part of the reel, a generally planar portion overlying said conveyor and a partition terminating at the discharge and spaced above the upper reach of said conveyor to define a gap; a moveable valve bridging the gap between said partition and the upper reach of said conveyor, said valve being substantially coextensive with the width of said conveyor; means for producing a stream of high velocity air from an area generally beneath the lower reach of said conveyor extending into a passage-way laterally adjacent and downstream of the discharge end of said conveyor and said valve to entrain and thus separate lighter from heavier crop components; said moveable valve means serving to permit the delivery of the material from the upper run of the conveyor to the passage but to restrict and minimize air flow from the casing and the upper run of the conveyor whereby no substantial separation occurs thereat; and a conveyor adjacent said first mentioned conveyor to receive the remaining heavier crop components.

4,178,744

AGRICULTURAL MOWERS

Robert Allely, Coventry, and Alfred J. Bailey, Berkswell, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

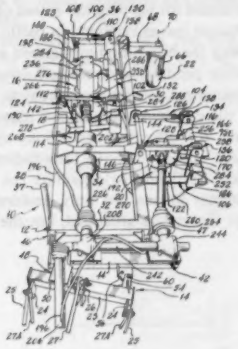
Filed Dec. 23, 1977, Ser. No. 863,660

Claims priority, application United Kingdom, Jan. 6, 1977, 00309/77; Jun. 3, 1977, 23595/77

Int. Cl.[2] A01D *35/26*

U.S. Cl. 56—16.2 **7 Claims**

1. An agricultural mower comprising: a rotor support member; at least two crop-cutting rotors adapted to have crop cutting blades mounted thereon, the rotors being mounted on the support member and being rotatable about respective upwardly-extending axes; a plurality of crop cutting blades mounted on each crop cutting rotor; a ground engageable support wheel mounted on the support member to support it at a level above that of the crop cutting blades; and attachment means secured to the support member for connecting the support member to a tractor whereby the mower can be drawn by the tractor; characterized in that said rotor support member comprises a rigid rotor support framework having a front beam located on the forward side, with respect to the direction of operative forward motion of the mower, of the axes of rotation of the crop-cutting rotors, a rear beam rigidly secured



to the front beam and located on the rearward side, with respect to said direction, of the axes of rotation of the crop-cutting rotors, said ground-engageable support wheel is mounted on the rear beam of the rotor support; said one crop-cutting rotor is connected to the front beam by a linkage capable of pivotal movement relative to the front beam whereby the rotor can rise and fall relative to the front beam during use so as to follow ground contours, the forward end of the linkage with respect to said direction of operative forward motion being connected to the front beam and the rearward end of the linkage being connected to said one rotor so that, in use, the rotor is trailed from the front beam.

4,178,745

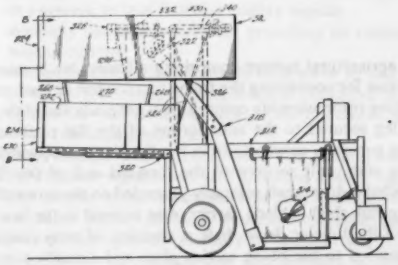
TOBACCO HANDLING APPARATUS

Robert W. Wilson, Charlotte, N.C., assignor to Powell Manufacturing Company, Inc., Bennettsville, S.C.

Continuation-in-part of Ser. No. 629,974, Nov. 7, 1975, abandoned. This application Nov. 4, 1976, Ser. No. 738,968

Int. Cl.[2] A01D *45/16*

U.S. Cl. 56—27.5 **7 Claims**



1. Tobacco handling apparatus for transferring harvested tobacco leaves from a source to tobacco container means in preparation for support of said tobacco leaves during subsequent curing thereof, said apparatus comprising conveyor means adapted to receive harvested tobacco leaves from a

source and arranged for discharging the leaves from an end thereof in a flow path having a substantial maximum horizontal extent, tobacco container means disposed below said horizontal extent of said flow path and having a longitudinal horizontal extent aligned with and disposed underneath the maximum horizontal extent of said flow path for receipt of the tobacco leaves discharging from said conveyor means discharge end, and means for varying the horizontal extent of said flow path within said maximum extent and over said longitudinal horizontal extent of said container means in a generally uniform manner to cause said leaves to be distributed substantially uniformly along the longitudinal extent of said tobacco container means, said means for varying the extent of the flow path of discharging tobacco leaves comprising baffle means having surfaces for stopping the horizontal movement of the leaves in said flow path while permitting continued downward movement and for imparting a lateral movement to the leaves in conjunction with the continued downward movement thereof and moving means for effecting repetitious cyclical movements of said baffle means in both longitudinal and lateral horizontal directions sufficient to distribute the leaves within said tobacco container means not only uniformly along the longitudinal extent thereof, as aforesaid, but the lateral extent thereof as well.

4,178,746

ROTARY MOWERS

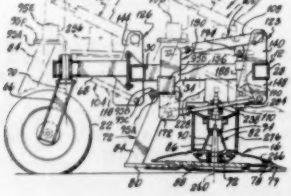
Robert Allely, Coventry, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 23, 1977, Ser. No. 864,023

Claims priority, application United Kingdom, Mar. 17, 1977, 11283/77; Jun. 1, 1977, 00309/77

Int. Cl.[2] A01D *45/02*

U.S. Cl. 56—53 **5 Claims**



1. An agricultural mower comprising a frame, hitch means on the frame for connecting the frame to a tractor; at least one crop cutting rotor assembly comprising a generally flat plate, a support leg secured to the rear portion of the flat plate and extending generally upwardly from the flat plate, an upwardly extending stub shaft secured to the forward end of the flat plate, a tubular drive shaft rotatably journaled on the upwardly extending stub shaft, a blade carrier plate secured to the lower portion of the tubular drive shaft, a plurality of crop cutting blades secured to the blade carrier plate and extending outwardly beyond the outer edge of the blade carrier plate, drive means for rotating the tubular drive shaft and the blade carrier plate attached to and supported on the upper end of the tubular drive shaft, and a linkage assembly secured to the upper end of the support leg and the frame, said linkage assembly permitting the generally flat plate to move up and down relative to the frame.

4,178,747

ROTARY EDGE CUTTER

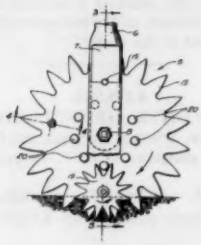
Stanley H. Williams, 52 Princes Hwy., Sylvania, New South Wales, Australia (2224)

Filed Mar. 6, 1978, Ser. No. 883,976

Claims priority, application Australia, Mar. 11, 1977, 9366

Int. Cl.[2] A01G *3/06*

U.S. Cl. 56—256 **2 Claims**



1. A herbage trimmer comprising a larger, toothed rotatable cutting blade, a smaller, toothed rotatable cutting blade lying flatly against the larger blade and positioned within the tooth tip circle of the larger blade such that some of its teeth overlap with some of the teeth of the larger blade, a plurality of bosses on said larger blade disposed in circular array concentric with said larger blade and in gear-tooth relationship with the teeth of the smaller blade such that counter clock-wise rotation of the larger blade effects clockwise rotation of the smaller blade, thereby producing a continuous shearing action between those teeth of the two blades overlapping for the time being.

4,178,748

OPEN-END SPINNING MACHINE APPARATUS WITH A TRAVELING DEVICE FOR BOBBIN EXCHANGE AND METHOD OF USING SAME

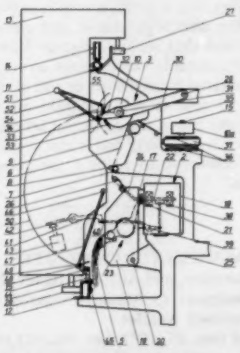
Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed May 2, 1977, Ser. No. 792,556

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620428

Int. Cl.[2] D01H *15/00, 9/10*

U.S. Cl. 57—263 **9 Claims**



1. Spinning machine apparatus comprising:

a plurality of spinning units, each having an open-end spinning rotor for spinning thread,

a bobbin holder at each spinning unit for holding bobbins to wind up thread produced by the spinning units,

a supply station fixedly disposed at each spinning unit for storing a supply of at least one empty spool tube to be

wound, each of said empty spool tubes being provided with a starter thread thereon of a length sufficient for at least one winding on process,

tube transfer means carried by a traveling servicing device guided on tracks for movement to respective servicing positions adjacent respective spinning units, said tube transfer means including means for automatically sequentially removing a full bobbin from one of said bobbin holders and transferring one of said empty spool tubes from a respective supply station at a spinning unit to said bobbin holder,

and means for returning a free end of the respective starter thread to a spinning rotor of a spinning unit to accommodate a piecing operation,

whereby the supply of the prepared empty spool tubes at said supply stations simplifies the constructional arrangement of the automatic tube transfer means while providing the advantages of substantially automatic bobbin changing operations for an open-end spinning machine.

4,178,749
METHOD AND APPARATUS FOR EXECUTION OF A PIECING PROCESS

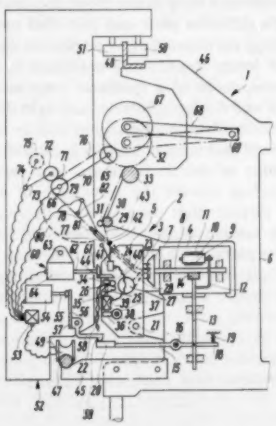
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7341 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, both of Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,465

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725105

Int. Cl.[2] D01H *15/00, 1/12, 1/32*

U.S. Cl. 57—263 **34 Claims**



1. A process for yarn piecing on an open-end spinning machine comprising:

returning a yarn end to piece the same with a fiber ring in a spinning rotor of a spinning assembly of the spinning machine,

withdrawing the pieced yarn from the spinning assembly,

and controlling the operations of said spinning assembly during piecing by way of a predetermined piecing control program,

wherein a plurality of different piecing control programs are provided for accommodating selection of respective different programmed operating conditions of the spinning assembly during at least a portion of the piecing operations,

wherein the quality or presence of the spun yarn at the intended piecing place is monitored during said withdrawing,

wherein the selection of the piecing control program to be utilized for the next piecing operation at said spinning assembly is automatically made in dependence on the monitored quality or presence of the pieced place,

and wherein the selection of the piecing control program to be utilized, when the next preceding piecing operation at said spinning assembly results in no pieced place, includes selection of a different control program than the one used in said next preceding piecing operation.

4,178,750
CONTROL CIRCUIT FOR ELECTRONIC TIMEPIECE

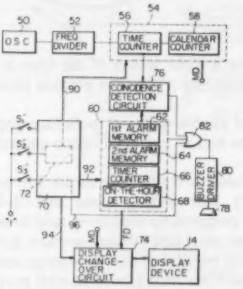
Tomomi Murakami, Higashiyamato, and Singo Ichikawa, Sayama, both of Japan, assignors to Citizen Watch Company Limited, Japan

Filed Oct. 4, 1977, Ser. No. 839,259

Claims priority, application Japan, Oct. 6, 1976, 51-119977; Oct. 6, 1976, 51-119978

Int. Cl.[2] G04B *19/24;* **G04C** *3/00, 9/00*

U.S. Cl. 58—4 A **9 Claims**



1. A multi-function electronic timepiece which operates in a time-keeping function mode and a plurality of secondary function modes, comprising:

a frequency standard providing a relatively high frequency signal;

a frequency divider providing a time unit signal in response to said relatively high frequency signal;

time-keeping circuit means responsive to said time unit signal for providing time information signals;

a function circuit including a plurality of circuit means for performing said plurality of secondary functions and for providing function display signals;

display means including a time display station for displaying time information in response to said time information signals, and a plurality of function display marks for displaying said plurality of secondary functions, respectively, in response to said function display signals;

a manually operable switch for providing an output pulse when actuated;

a control circuit including means responsive to said output pulse for generating an output signal indicative of a state in which a selected one of said plurality of circuit means is in a controllable state; and

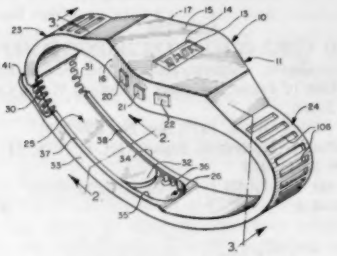
display change-over circuit means for passing said time information signals and said function display signals to said display means in said time-keeping function, whereby said time display station is operative to display said time information and said plurality of function display marks are effective to indicate that said plurality of secondary functions are set, in said time-keeping function mode; said display change-over circuit being responsive to said output signal from said control circuit whereby only one of said plurality of function display marks corresponding to the circuit means in said selected state is effective to indicate when said selected one of said plurality of circuit means is in the controllable state.

4,178,751

INTEGRALLY MOLDED WATCH CASING AND BAND

James P. Liautaud, River and Bluff Rds. Trout Valley, Cary, Ill. 60013

Filed Mar. 9, 1977, Ser. No. 775,785
Int. Cl.[2] G04B *37/08*; G04C *3/00*
U.S. Cl. 58—23 R **14 Claims**



1. A casing for a wrist watch of the type including a time-keeping module having a read-out portion therein, said casing comprising:

a base strip of pliable material including opposing elongate end portions and an enlarged raised central portion therebetween;

an exterior plastic body portion molded over said base strip substantially surrounding same and defining opposed wrist band portions formed over said base strip elongate ends and an enlarged central portion formed over said raised central portion of said base strip, contiguously with said band portions, said plastic central portion including a recess for mounting said time-keeping module therein; and

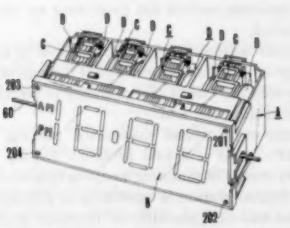
said enlarged central portions of said strip and said body portion including apertures therein for rendering said module read-out portion visible from the exterior of the watch casing when said module is mounted in said recess.

4,178,752

SHUTTER TYPE DIGITAL CLOCKS

Hideo Umezaki; Katsuharu Doma, both of Tokyo; Toshiro Konno, Kawanishi; Fumio Yanashita, Izumi; Yoshio Saito, Kurokawa, and Tosuke Sawafuji, Izumi, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo and Yanashita Seiko Kabushiki Kaisha, Izumi, both of, Japan

Filed Nov. 21, 1977, Ser. No. 853,765
Claims priority, application Japan, Nov. 24, 1976, 51-157802; Dec. 10, 1976, 51-149091; Dec. 25, 1976, 51-175078; Mar. 31, 1977, 52-40524
Int. Cl.[2] G04C *17/02*
U.S. Cl. 58—126 E **17 Claims**



1. A shutter type digital clock comprising a display substrate including hour, ten minutes and minute display members each constituted by a plurality of display digit openings which are arranged in the form of a letter 8 and a ten o'clock display member constituted by display digit openings which are arranged in the form of a letter "1"; a light diffusion plate located on the rear side of said display substrate and provided with a plurality of shutter guide openings corresponding to said respective display members; a lamp house block located on the rear side of said light diffusion plate and provided with a plurality of lamp openings corresponding to said respective display members; a plurality of lamps respectively accommodated in said lamp openings; a frame made of a synthetic resin and adapted to support said display substrate, said light diffusion plate and said lamp house block; a plurality of shutter units each including a plurality of shutter members located on the rear side of said lamp house block and extending to the front side of said light diffusion plate for selectively opening and closing said display digit openings; each shutter member being provided for each one of said display digit openings; and a plurality of cam control mechanisms associated with a synchronously operated digit shift mechanism and adapted to control the positions of respective shutter members of said shutter units; said frame including a pair of opposed side walls, and a supporting wall which is parallel with said display substrate and provided with a plurality of bearing members adapted to pivotally support said shutter members of said shutter units, and a plurality of bearing members adapted to rotably support rotary cams of said cam control mechanisms.

6. A shutter type digital clock comprising a display substrate provided with hour, ten minutes and minute display members each constituted by a plurality of display digit openings which are arranged in the form of a letter 8, and a ten o'clock display member constituted by display digit openings which are arranged in the form of a letter 1; a light diffusion plate disposed on the rear side of said display substrate and provided with a plurality of shutter guide openings corresponding to respective display members; a lamp house block disposed on the rear side of said light diffusion plate and provided with a plurality of lamp openings corresponding to respective display members; a plurality of lamps respectively contained in said lamp openings; a frame made of a synthetic resin and supporting an assembly of said display substrate, said light diffusion plate and said lamp house block; a plurality of shutter units disposed on the rear side of said lamp house block; each shutter unit including a plurality of shutter members, each including a shutter piece extending toward the front face of a respective and associated display digit opening for selectively opening and closing the same; synchronously operated digit shift mechanisms; and a plurality of cam control mechanisms cooperating with said digit shift mechanisms for controlling the positions of respective shutter members of said shutter units; said display substrate and the respective shutter pieces of said shutter members of the shutter units being made of opaque synthetic resins of the same color and said light diffusion plate being made of a colored synthetic resin containing a phosphor pigment.

4,178,753

PENDANT COMPRISING A SLEEVE IN COMBINATION WITH A TIMEPIECE

Emil Schenker, Grenchen, Switzerland, assignor to Sorna Watch S.A., Grenchen, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,718
Claims priority, application Switzerland, Sep. 7, 1977, 10916/77; Feb. 15, 1978, 1651/78
Int. Cl.[2] G04B *47/00*
U.S. Cl. 58—152 R **7 Claims**

1. A pendant comprising a sleeve, to which a writing implement, more especially, a ballpoint pen may be attached at one end of said sleeve in combination with a timepiece, in which the timepiece has a housing which, by means of a plurality of locking detents having gaps therebetween, is removably connected to the sleeve, wherein one of said gaps between the locking detents is wider than the others of said gaps and in which a projection is provided in the sleeve, a clip disposed in said projection, and in which the sleeve has two opposed

apertures for pulling through a necklace-type strip and in which the wider gap and the apertures for the necklace-type

strip are so arranged that the timepiece, when worn around the neck, is readable.

4,178,754

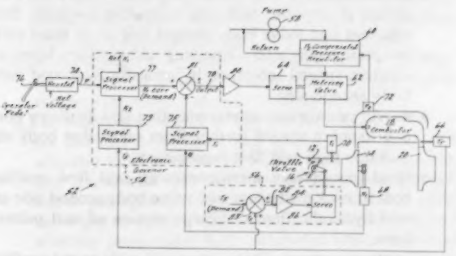
THROTTLEABLE TURBINE ENGINE

Ernest R. Earnest, Hobe Sound, Fla., assignor to The Hydragon Corporation, Lake Park, Fla.

Continuation-in-part of Ser. No. 706,810, Jul. 19, 1976, abandoned. This application Jul. 13, 1977, Ser. No. 815,251

Int. Cl.[2] F02C *9/04, 9/14*

U.S. Cl. 60—39.03 **18 Claims**



1. An integrated Brayton cycle-Kankine cycle engine comprising a Rankine turbine and a rotary compressor driven thereby, a Brayton turbine and an intercycle heat exchanger heated by the exhaust of the Brayton turbine and delivering heat to the Rankine fluid for powering the Rankine turbine, a combustor and air supply assembly for delivering to the Brayton turbine air from the compressor together with products of combustion from the combustor, and control means responsive to engine operating conditions for adjusting the fuel flow into the combustor and for throttling the amount of air entering the compressor.

4,178,755

FORCED AIR CONTROL VALVE FOR EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

Leo T. Klimazewski, and James A. McNairy, both of St. Louis, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,138

Int. Cl.[2] F01N *3/10*

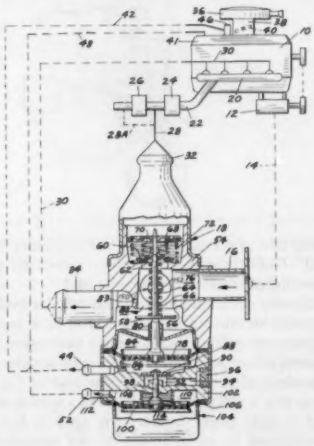
U.S. Cl. 60—290 **2 Claims**

1. An air control valve for use on an internal combustion engine having an exhaust system with a catalytic converter bed therein and an air pump for supplying air to the exhaust system, said air control valve comprising:

a valve body having a main air chamber, an air inlet extending to the main air chamber, and a pair of air outlets leading from the main air chamber, one of said air outlets being connected to the exhaust manifold upstream of the catalytic converter bed and the other outlet diverting air away from the catalytic converter bed;

a valve assembly positioned in the main air chamber between the inlet and said pair of outlets for alternating air flow between said pair of outlets, said valve assembly having a main valve member and a secondary valve member mounted thereon, said main valve member controlling air flow through said one outlet and said secondary valve member controlling air flow through said other outlet, said valve assembly being shifted between two positions, one in which the main valve member is open to supply air to said one outlet with the secondary valve member closed and a second position in which the secondary valve member is open to supply air to said other outlet with the main valve member being closed;

a main diaphragm assembly secured to the valve body and connected to the valve assembly, spring biasing means to urge the diaphragm assembly and the valve assembly to



said other position in which the main valve member is closed and the secondary valve member is open, said valve body having a main vacuum chamber on one side of the main diaphragm assembly, a vacuum line extending from the intake manifold of the internal combustion engine to the main vacuum chamber, temperature responsive means operatively connected to said vacuum line to permit the exertion of a vacuum against the diaphragm assembly only during cold engine operation, said temperature responsive means being effective to interrupt the vacuum exerted against the diaphragm assembly during warm engine operation to maintain the main valve member in a closed position for diverting air away from the catalytic converter bed during warm engine operation; and

vent valve means venting the main vacuum chamber to atmosphere upon a rapid deceleration of the internal combustion engine during both cold engine operation and warm engine operation.

4,178,756

VACUUM UNION FOR AN INTERNAL COMBUSTION ENGINE

Eiji Adachi; Juichi Shibatani, and Sadayoshi Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 14, 1977, Ser. No. 815,772

Claims priority, application Japan, Oct. 25, 1976, 51-127374

Int. Cl.[2] B60T *13/46*

U.S. Cl. 60—397 **1 Claim**

1. A vacuum-operated system in a vehicle internal combus-

tion engine having an intake pipe in which vacuum pressure is produced, said system comprising:

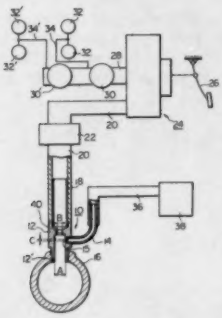
a vacuum-operated brake booster;

at least one vacuum-operated engine controlling device; and

a vacuum union for transmitting a vacuum signal from the intake pipe to both the brake booster and the at least one engine controlling device, said vacuum union comprising:

a tubular body which has one end thereof connected to the intake pipe and the other end thereof connected to the brake booster, said body having a lateral hole formed in the tubular wall of said body, said hole having a portion of a small dimension;

a branch pipe having one end thereof fixably inserted into an



outer end of the lateral hole of the tubular body, the other end of said branch pipe being connected to said at least one engine controlling device; and

a stationary orifice defined in said tubular body at a position located on one side of said lateral hole remote from said intake pipe, said orifice having a dimension larger than the dimension of said lateral hole and smaller than a corresponding dimension of said one end of the tubular body, whereby a sufficient level of the vacuum signal transmitted to said brake booster via said orifice is effectively maintained for maintaining proper operation of the brake booster even if the branch pipe is accidentally opened to the atmosphere during the use of the union due to one of said at least one engine controlling device being damaged.

4,178,757

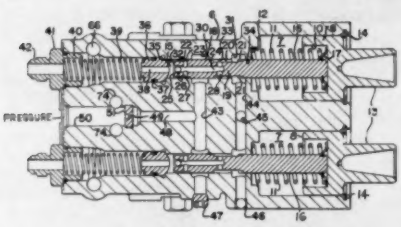
FLOW CONTROL MEANS

Edwin Ketterling, Libertyville, and Benjamin R. Nelson, Lindenhurst, both of Ill., assignors to White Farm Equipment Company, Eastlake, Ohio

Filed Aug. 10, 1977, Ser. No. 823,469

Int. Cl.[2] B60T *13/12*

U.S. Cl. 60—548 **4 Claims**



1. For combination in a vehicle hydraulic brake system having right and left wheel brake cylinders, a source of hydraulic pressure when the vehicle is operating, a hydraulic fluid reservoir, and manually actuated brake applicator means, brake system actuating and control valve means for operatively interconnecting said source of hydraulic pressure, said hydraulic fluid reservoir, said manually activated brake applicator means and said wheel brake means, comprising in combination:

a valve for each of said brake cylinders adapted to be operatively interconnected therewith by conduit means and having a valve body which has,

an elongated straight-through primary bore extending between first and second sides of said valve body and having at its first end adjacent said first side a chamber for receiving a manually actuated brake piston with a capacity for containing a substantial volume of hydraulic fluid, said primary bore at its opposite second end adjacent said second side having a hydraulic fluid discharge section for receiving a free piston and adapted to be interconnected by conduit means with one of said brake cylinders, and said primary bore having an interconnecting section including a pair of spaced circumferential chambers dividing said interconnecting section into lands at opposite ends thereof and an intermediate land between said circumferential chambers, one of said circumferential chambers being nearest said valve body first side and the other of said circumferential chambers being nearest said valve body second side,

a first auxiliary bore paralleling said primary bore and extending from open communication at its first end with said brake piston receiving chamber to a closed second end adjacent said valve body second side,

a second auxiliary bore paralleling said primary bore and closed at opposite ends and extending inwardly from adjacent said valve body second side to an inner end,

a first passageway interconnecting said auxiliary bores at a location spaced substantially inwardly from said valve body second side,

a second passageway interconnecting said auxiliary bores at a location spaced further from said valve body second side than said first passageway,

a third passageway interconnecting said first auxiliary bore at its end adjacent said valve body second side and said hydraulic fluid discharge section of said primary bore,

a fourth passageway interconnecting said second auxiliary bore at its end adjacent said valve body second side with said hydraulic fluid discharge section of said primary bore,

a first fluid-return passageway for interconnecting said inner end of said second auxiliary bore with said hydraulic fluid reservoir,

a second fluid-return passageway for interconnecting the circumferential chamber of said interconnecting section nearest said valve body first side with said hydraulic fluid reservoir,

a pressurized fluid inlet passageway with metering orifice therein for receiving hydraulic fluid under pressure from said source thereof and interconnecting on the downstream side of said metering orifice with said circumferential chamber of said interconnecting section nearest said valve body second side,

a fifth passageway interconnecting said pressurized fluid inlet passageway on the upstream side of said metering orifice with said second auxiliary bore therein at a location intermediate the connections therewith of said first and fourth passageways;

a manually actuated brake piston in said piston receiving chamber of said primary bore adapted to be operatively interconnected with said manually actuated brake applicator means of said brake system;

said free piston in said hydraulic fluid discharge section having a passage permitting fluid flow from side to side therethrough;

a first valve spool interfitting and reciprocal within said interconnecting section of said primary bore and having, an extension on a first end engageable with said brake

piston for reciprocation in unison therewith, a second end opposite said first end operable in the end land of said interconnecting primary bore adjacent said hydraulic fluid discharge section,

a reduced diameter section providing in one position of said valve spool communication between said spaced circumferential chambers in said interconnecting section said one position being the one said valve spool occupies when said brake system is in its brake fill stage,

spaced radial passageways a first being adjacent said second end of said valve spool and providing fluid flow communication into said hydraulic fluid discharge section of said primary bore and the second opening into said reduced diameter section,

a passageway interconnecting said radial passageways,

said valve spool having a neutral position in said primary bore when said brake piston is in its non-actuated fully retracted position, a first actuated position wherein fluid under pressure is allowed to flow from said pressurized fluid inlet passageway through said spaced radial passageways and said interconnecting passageway into said hydraulic fluid discharge section, a second actuated position wherein said reduced diameter section provides communication between said first and second circumferential chambers, and a third actuated position wherein hydraulic fluid cannot flow into said hydraulic fluid discharge section and said second end of said valve spool acts directly on said free piston in said fluid discharge section;

a first spring-closed check valve in said third passageway unseatable to allow fluid to flow from said first auxiliary bore into said hydraulic fluid discharge section,

a second spring-closed check valve in said second passageway unseatable to allow fluid to flow from said second auxiliary bore into said first auxiliary bore;

a free relief valve piston in said second auxiliary bore in the end thereof adjacent said second valve body side whereby fluid from said hydraulic fluid discharge section introduced into said second bore through said fourth passageway acts on the end of said free relief valve piston nearest said valve body second side and whereby pressurized fluid introduced into said second auxiliary bore through said fifth passageway acts on the opposite end of said free relief valve piston;

a relief valve spool reciprocable in said second auxiliary bore having a radial passageway therein communicating with a longitudinal passageway therein extending on the side of said radial passageway opposite from said free relief valve piston and into communication with said inner end of said second auxiliary bore, said relief valve spool being positionable on actuating engagement by said free relief valve piston to where said radial passageway therein communicates with said first passageway;

a first spring in said piston-receiving chamber biasing said brake piston therein towards its retracted position;

a second spring in said hydraulic fluid discharge section biasing said free piston therein toward said spool valve therein; and

a third spring in said second auxiliary bore biasing said relief valve spool therein towards said free relief valve piston.

4,178,758

PARTIAL OXIDATION PROCESS

Peter L. Paull, Weston, Conn., and Rodney McGann, Santa Cruz, Calif., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 855,645, Nov. 29, 1977, which is a continuation-in-part of Ser. No. 698,439, Jun. 21, 1976, Pat. No. 4,099,382. This application Oct. 30, 1978, Ser. No. 956,135

Int. Cl.[2] F01K *27/00*

U.S. Cl. 60—648 **46 Claims**

1. In the process for producing gaseous mixtures comprising H_2, CO and containing at least one member of the group H_2O, CO_2, H_2S, COS, CH_4, N_2, A_r, and particulate carbon by the partial oxidation of a hydrocarbonaceous fuel, or liquid oxygenated hydrocarbonaceous fuel, or a slurry of solid carbonaceous fuel and water or a liquid hydrocarbon with a free oxygen containing gas and optionally in the presence of a temperature moderator, at a temperature in the range of about 1 to 250 atmospheres absolute in the reaction zone of a free-flow noncatalytic gas generator, the improvement comprising: (1) continuously passing the effluent gas stream leaving the reaction zone of said gas generator through a first heat exchange zone comprising a shell and tube heat exchanger in heat exchange with a continuous stream of steam, at a higher pressure than

said effluent gas stream, thereby converting said steam into a continuous stream of superheated steam while simultaneously reducing the temperature of the continuous stream of effluent gas, and simultaneously continuously bleeding a portion of said steam into said stream of effluent gas by way of openings in the walls of said tubes while placing a sheath of steam between the surface of said tubes and the stream of effluent gas passing through said first heat exchange zone; (2) removing from said first heat exchange zone a continuous stream of effluent gas containing said bleed steam; and (3) simultaneously removing a continuous stream of said superheated steam from said first heat exchange zone.

4,178,759

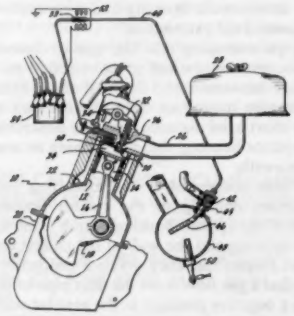
ION REPULSION ENGINE AND METHOD OF OPERATING SAME

Billy G. Cook, 140 E. Millan St., Chula Vista, Calif. 92010

Filed Apr. 7, 1978, Ser. No. 894,474

Int. Cl.[2] F03G *7/00*

U.S. Cl. 60—721 **11 Claims**



1. In a reciprocating engine having at least one cylinder closed at one end by a cylinder head and having a slidable piston located in said cylinder defining a cylinder space between said head and said piston, at least one intake valve com-

municating between said cylinder space and a source of an oxygen-containing gas and at least one exhaust valve communicating between said cylinder space and an exhaust system, the improvement comprising:

at least one first enclosed porous conductive electrode in fluid flow communication with said cylinder space;

at least one second enclosed porous conductive electrode in fluid flow communication with said exhaust system;

an electrical conductor connectable between said first and second electrodes;

means permitting said oxygen containing gas to be compressed in said first electrode during movement of said piston toward said cylinder head; and

means for feeding fuel to said second electrode;

whereby oxygen is ionized in said first electrode as said air is compressed, electrons flow through said conductor to said second electrode to ionize fuel therein, providing an increase in pressure in said cylinder space due to ion repulsion.

4,178,760

FILTER DUST EJECTOR AND CHECK VALVE ARRANGEMENT IN EXHAUST SYSTEM OF INTERNAL COMBUSTION ENGINE

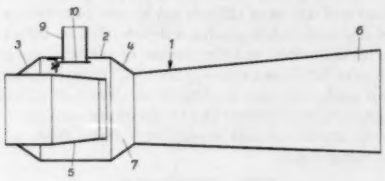
Herbert Alf, Ludwigsburg, and Fritz Bussinger, Grossachsenheim, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,413

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 7636707[U]

Int. Cl.[2] F01N *5/04*

U.S. Cl. 60—319 **7 Claims**



1. A filter dust ejector designed for incorporation in the exhaust system of an internal combustion engine and for connection to its air intake filter, so that a negative pressure created by engine exhaust gas in the ejector draws dust-laden air from the filter into the exhaust system, for discharge with the exhaust gas, said filter dust ejector comprising in combination:

an ejector housing defining a longitudinal flow axis and having an upstream opening and a downstream opening on opposite axial extremities;

an inlet pipe extending into the ejector housing from the upstream opening thereof so as to define an annular suction space between it and the wall of the ejector housing, the inlet pipe having an open downstream extremity located a short axial distance from the downstream opening of the ejector housing, thereby forming an annular suction gap therewith;

an outlet pipe connected to and extending away from the downstream opening of the ejector housing; the wall portion of the ejector housing which leads to said downstream opening and the wall of the connected outlet pipe being so shaped that they define a venturi-type flow profile, so that a gas flow from the inlet pipe to the outlet pipe creates a negative pressure in the annular suction gap and, consequently, in the suction space of the ejector housing;

a suction connector in the form of a length of pipe which protrudes a short distance into the suction space of the ejector housing and serves as an inlet for said dust-laden air drawn from the filter; and

check valve means arranged inside the ejector housing and associated with the suction connector, the check valve means being operable to close the suction connector, in the event of a pressure condition in the suction space of the ejector housing tending to create an outflow of gas through the suction connector; and wherein said check valve means includes:

a valve seat on the inwardly protruding extremity of the suction connector; and

a pivotable flapper cooperating with the valve seat, the pivot axis of the flapper being located outside the suction connector, on the axially upstream side thereof within the ejector housing, and oriented perpendicularly to a plane which includes the axes of the suction connector and of the ejector housing.

4,178,761

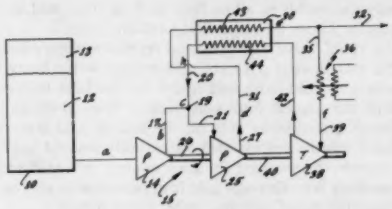
HEAT SOURCE AND HEAT SINK PUMPING SYSTEM AND METHOD

Everett H. Schwartzman, 724 Cloyden Rd., Palos Verdes Estates, Calif. 90274

Filed Jun. 17, 1977, Ser. No. 807,359

Int. Cl.[2] F01K *25/10*; F17C *7/02*

U.S. Cl. 60—648 **27 Claims**



25. A pumping system for a liquid in which the output of the system is at a higher pressure than the pressure of the liquid in a storage source comprising:

pump means connected to said source for receiving the liquid whose thermodynamic condition of state is that of liquid saturation or in the subcooled region based on the pressure-enthalpy curve for the material in said source,

means forming an outlet for said pumping system,

heat exchanger means receiving the liquid from said pump means,

means forming a supply of vaporized liquid whose thermodynamic condition of state is in the saturated or superheated region of the pressure-enthalpy curve for the material,

turbine means receiving said vaporized liquid for producing power for the operation of said pump means and providing a turbine exhaust in gaseous form but at a pressure at or below said system output pressure,

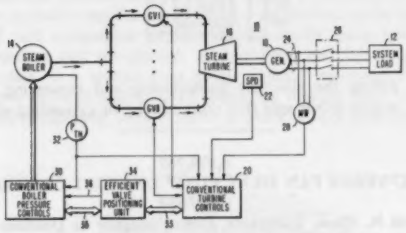
means to flow said turbine exhaust through said heat exchanger for recondensation of said exhaust into liquid form such that the thermodynamic condition of state of said recondensed exhaust is that of liquid saturation or in the subcooled region based on the pressure-enthalpy curve for said material, and

means for admixing said recondensed vapor with liquid material whose thermodynamic condition of state is that of liquid saturation or in the subcooled region based on the pressure-enthalpy curve for said material.

4,178,762
EFFICIENT VALVE POSITION CONTROLLER FOR USE IN A STEAM TURBINE POWER PLANT

Morton H. Binstock, Pittsburgh, and Steven J. Johnson, McCandless Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1978, Ser. No. 889,764
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—667 27 Claims



1. In a power plant for generating electrical energy at a desired power generation level including a boiler for generating steam at a boiler throttle pressure which is governed by a pressure set point; a steam turbine having a plurality of steam admission valves for regulating the amount of generated steam therethrough; a valve control means governed by a reference signal corresponding to the desired power generation level to position said plurality of steam admission valves in a state according to a predetermined valve positioning pattern based on the value of said reference signal; and an electrical generator driven by said steam turbine to generate electrical energy, a system for efficiently positioning said plurality of steam admission valves to effect the desired power generation level, said system comprising:

first means for adjusting said pressure set point based on a function of a selected one of a plurality of predetermined values of said reference signal, said predetermined values substantially corresponding to efficient valve position states for regulating steam admission to said turbine;

second means governed by said pressure set point adjustment to modulate said reference signal substantially to the selected value, whereby the steam admission valves are positioned at an efficient valve position state to regulate steam admission corresponding to the desired power generation level.

4,178,763
SYSTEM FOR MINIMIZING VALVE THROTTLING LOSSES IN A STEAM TURBINE POWER PLANT

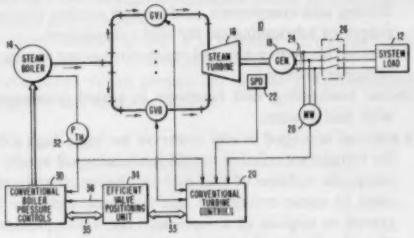
Louis P. Stern, Wadsworth, Ohio, and Steven J. Johnson, McCandless Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 24, 1978, Ser. No. 889,770
Int. Cl.[2] F01K *13/02*
U.S. Cl. 60—667 18 Claims

7. In a power plant that generates electrical energy at a desired power generation level including a steam producing boiler having a boiler throttle pressure associated therewith; a steam turbine having a plurality of steam admission valves for regulating the amount of boiler produced steam conducted therethrough; and an electrical generator driven by said steam turbine to generate electrical energy at said desired power level, a system for minimizing the power plant energy losses substantially caused by steam flow throttling across partially opened steam admission valves, said system comprising:

means for selecting one of a plurality of predetermined steam admission valve position states which substantially correspond to minimizing valve throttling losses;

first means governed by said selected predetermined steam admission valve position state to adjust the boiler throttle pressure of said steam boiler; and

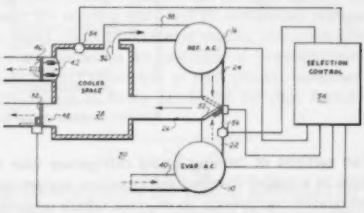


second means responsive to said adjustment of boiler throttle pressure to position said plurality of steam admission valves to selected state by maintaining the generated energy substantially at the desired power generation level.

4,178,764
AIR CONDITIONING SYSTEM

Jerry R. Rowe, Rte. #2, Box 153-10, Springtown, Tex. 76082

Filed Nov. 21, 1977, Ser. No. 853,253
Int. Cl.[2] F25D *7/00*
U.S. Cl. 62—81 17 Claims



1. In an air conditioning system having

a. an evaporative cooler which uses outside air from outside the cooled space,

b. a refrigerated cooler,

c. a cooled space,

d. at least one duct connecting each of said coolers to the cooled space, and

e. a space thermostat providing means for sensing space temperature of said cooled space;

the improved structure comprising in combination with the above:

f. initiation means for initiating cooling when said space temperature exceeds a limit space temperature, including

g. switching means for switching between said evaporative cooler and said refrigerated cooler responsive to the effectiveness of the evaporative cooler as it responds to relative humidity of outside air and temperature of outside air.

4,178,765
MEANS FOR CAUSING THE ACCUMULATION OF REFRIGERANT IN A CLOSED SYSTEM

Curtis R. Slayton, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 28, 1978, Ser. No. 920,098
Int. Cl.[2] F25B *43/00, 43/02, 39/04*
U.S. Cl. 62—83 17 Claims

1. A refrigeration system comprising:

a condenser,

an evaporator,

a hermetic compressor casing in a sealed series circuit, for permitting circulation of a charge of refrigerant,

an expansion device intermediate said condenser and evapo-

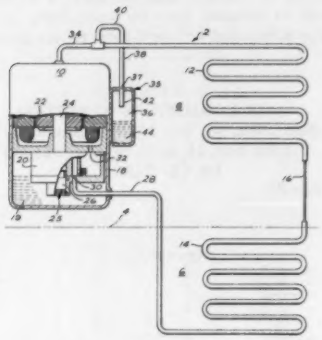
rator dividing said system into a high and low pressure portion,

said hermetic compressor casing having a refrigerant compressor for compressing refrigerant gas and a motor for driving said compressor, and a sump portion containing a supply of lubricating oil for said compressor,

a member providing a sealed reservoir, having an opening in its upper portion,

means connecting said reservoir in sealed communication with said system,

a material arranged in said reservoir having a high solubility for refrigerant relative to said lubricating oil in said casing sump, the volume of said material being an amount sufficient to cause enough of said refrigerant charge in said system to migrate as a vapor into the lower pressure area of said reservoir and into solution with said material so that liquid refrigerant present when the system is inactive will collect in the reservoir.



11. The method of causing liquid refrigerant into a preselected area in a sealed inactive refrigeration system including an oil lubricated compressor to migrate which comprises:

providing a member forming a sealed reservoir,

providing means connecting said resevoir in fluid communication with said sealed system,

arranging a volume of material in said reservoir having greater miscibility with said refrigerant relative to said compressor oil,

absorbing substantially all of said refrigerant which can exist as a liquid into the lower pressure area of said reservoir and into solution with said material when said system is inactive; and

allowing said refrigerant to migrate back into said system when said compressor operation causes a temperature rise in said reservoir that is sufficient to drive out the refrigerant that is in solution with said material.

4,178,766

THERMODYNAMIC COMPRESSOR METHOD

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Division of Ser. No. 708,863, Jul. 26, 1976, Pat. No. 4,107,945. This application Mar. 9, 1978, Ser. No. 884,832

Int. Cl.[2] F25B *3/00*

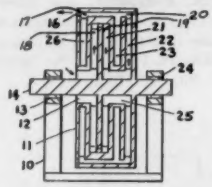
U.S. Cl. 62—88 **8 Claims**

1. A method of compressing a compressible fluid comprising:

a. alternately compressing and expanding said fluid in a first compressing and expanding means; subsequently

b. compressing said fluid in a second compressing means with accompanying temperature increase;

c. removing heat from said fluid downstream of the second compressing means and adding said heat into said fluid



during the alternate compressing and expanding steps, within either said first compressing or expanding means.

4,178,767

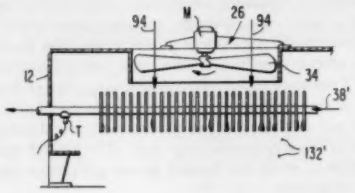
REVERSE FAN HEAT PUMP DEFROST CONTROL SYSTEM

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jun. 19, 1978, Ser. No. 917,040

Int. Cl.[2] F25B *13/00*

U.S. Cl. 62—155 **7 Claims**



1. In a heat pump including a finned outdoor coil acting selectively as a refrigeration condenser and evaporator and having a fan mounted adjacent the coil for blowing air upwardly and across the coil fins for effecting heat exchange between the moving air and refrigerant within the coil tubing, said heat pump including control means responsive to frost accumulation on the fins of said outdoor coil when said outdoor coil is acting as an evaporator under near-freezing ambient conditions for effecting a change in heat pump operation from heating mode to cooling mode and to thereby initiate defrosting of the coil by supplying hot refrigerant vapor to said coil and for terminating fan operation, the improvement comprising: said fan being a reversible direction fan, and said control means further comprising means for first delaying the termination of the heat pump cooling mode for defrost operation and the initiation of the heating mode, and secondly, for reversing the direction of forced air flow over the coil such that the air flow acts in conjunction with gravity to remove the last of the melted condensate from the fins.

4,178,768

INTERNALLY PILOTED REVERSING VALVE FOR HEAT PUMP

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Jan. 25, 1978, Ser. No. 872,231

Int. Cl.[2] F25B *13/00*

U.S. Cl. 62—160 **8 Claims**

1. A reversing valve for selectively porting refrigerant from compressor to air-conditioning/heat pump system comprising:

a housing means,

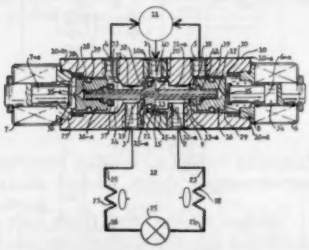
a first port means in said housing means for receiving compressor fluid under pressure,

a second port means in said housing means connected to a system condenser,

a third port means in said housing means connected to a system evaporator,

a fourth and a fifth port means connected to said compressor for fluid return thereto selectively,

a valve means in said housing slidable from a first position allowing pressurized fluid flow through interconnecting conduit means from said compressor to said condenser via said first and second port means for pressure reduction in an expander and for low pressure cold fluid return by way of said evaporator performing air conditioning before entering said compressor via said third and fourth port means, to a second heat pump position reversing fluid flow through said conduit means by forcing fluid from said compressor to flow under pressure to said evaporator



for heat extraction first via said first and third port means thereof to continue subsequent fluid expansion and return at low pressure to said compressor by way of said condenser via said second and fifth port means,

an operator means for changing said positions of said valve means when desired, an internal pilot piston means in said valve means communicating with compressor fluid under pressure at said first port means in an operable relationship with said operator means and connected to shift said valve means from one of said positions to the other of said positions by means of pilot fluid pressure force over said pilot piston means, and means for exhausting said pilot fluid into said conduit means at low pressure, at the end of each change of said positions, including means for maintaining said valve means in one of said positions substantially driftless.

4,178,769

SYSTEM FOR PRODUCING REFRIGERATION AND A HEATED LIQUID AND CONTROL THEREFOR

Clifford N. Johnsen, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Division of Ser. No. 872,406, Jan. 26, 1978, Pat. No. 4,134,274. This application Jun. 23, 1978, Ser. No. 918,529

Int. Cl.[2] F25B *39/04, 29/00*

U.S. Cl. 62—180 **5 Claims**

1. A system for producing refrigeration and selectively operable for producing a heated liquid comprising

a. compressor means for compressing a vaporized refrigerant;

b. air cooled condenser means connected to said compressor means for receiving compressed refrigerant and condensing same by heat exchange with a source of air, further including fan means for forcing said air in heat exchange relationship with said air cooled condenser means;

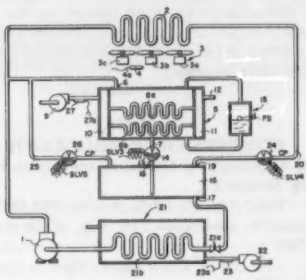
c. liquid cooled condenser means connected to said compressor means in parallel flow relationship with said air cooled condenser means for receiving compressed refrigerant and condensing same by heat exchange with a source of liquid, whereby a heated liquid is produced;

d. evaporator means for expanding and vaporizing said condensed refrigerant in heat exchange relationship with a refrigeration load and returning the vaporized refrigerant to said compressor means;

e. means for transferring condensed refrigerant from said air cooled and liquid cooled condenser means to said evaporator means and comprising

i. receiver means having a condensed refrigerant outlet connected to said evaporator means;

ii. first conduit means connecting said air cooled condenser means to said receiver means;



iii. second conduit means connecting said liquid cooled condenser means to said receiver means and including valve means therein for controlling the flow of condensed refrigerant through said second conduit means; and

iv. means for sensing the level of condensed refrigerant in said liquid cooled condenser means and controlling said valve means so as to maintain a predetermined level therein during operation of said system, whether or not heated liquid is being produced by said liquid cooled condenser means.

4,178,770

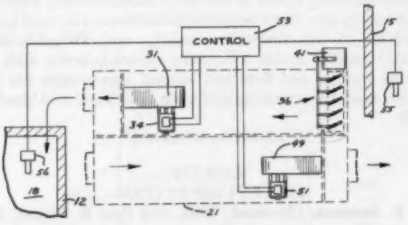
COLD AIR FLOW CONTROL APPARATUS

Lyle Fox, New Hope, Minn., assignor to Econo-Cooler, Inc., Osseo, Minn.

Filed Apr. 24, 1978, Ser. No. 899,560

Int. Cl.[2] F25D *17/04*

U.S. Cl. 62—186 **19 Claims**



1. A cold air flow and control apparatus to transfer cold outside air from the exterior of a building to a cold room in the building to supplement the refrigeration provided to the cold room by the usual refrigeration equipment, said apparatus comprising: housing means mounted exteriorly of the cold room having a chamber; air intake means disposed between the interior of the cold room and the exterior of the building to permit movement of cold air from the exterior of the building to the interior of the building comprising an upstream air intake duct extending from a location outside of the building to the intake chamber of the housing, and a downstream air intake duct extending from the intake chamber of the housing to a location inside of the cold room; an intake blower located in the chamber to move cold air through the air intake means from the exterior of the building to the interior of the cold

room; air exhaust means allowing air to flow out of the cold room; and control means including outside thermal responsive regulator means operative to prohibit operation of the intake blower when the outside temperature sensed by the control means exceeds a pre-selected upper temperature limit, and operative to permit operation of the intake blower when the outside temperature sensed by the control means is less than said upper temperature limit; said control means also including inside thermal responsive regulator means operable to cause the intake blower to operate when the temperature in the cold room approaches an upper temperature boundary and when the intake blower is permitted to operate by the outside thermal responsive regulator means, and operative to shut off the intake blower when the temperature in the cold room reaches a low temperature boundary.

4,178,771

COMPRESSOR REFRIGERATOR

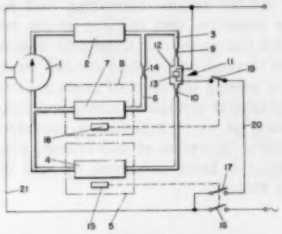
Bent Karll, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Apr. 19, 1978, Ser. No. 897,584

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717050

Int. Cl.[2] F25B *41/06*

U.S. Cl. 62—200 **2 Claims**



1. A refrigeration assembly, comprising, first and second compartments having lesser and greater cold requirements, compressor and condenser means in fluid flow series, first and second evaporator means in said compartments, first and second parallel conduit means extending from said condenser means to said first and second evaporator means, electrically operated blocking means in said first conduit means, a parallel circuit having first and second conductor means for said blocking means and said compressor means, a main switch in series with said parallel circuit, a blocking switch in series with said blocking means, and first and second thermostats for said compartments for operating said main switch and said blocking switch.

4,178,772

HEAT PUMP SYSTEM

Paul F. Swenson, Cleveland, Ohio, and Paul B. Moore, Fedhaurn, Fla., assignors to Consolidated Natural Gas Service Company, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 737,776, Nov. 1, 1976, Pat. No. 4,055,964. This application Oct. 25, 1977, Ser. No. 845,229

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.[2] F25B *27/02, 13/00, 1/00*

U.S. Cl. 62—238 **40 Claims**

1. A fluid heating and cooling system comprising:

a refrigeration circuit having a compressor with an inlet and an outlet, an indoor refrigeration circuit heat exchanger, and an outdoor refrigeration circuit heat exchanger,

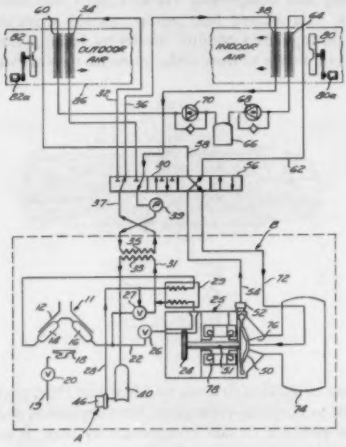
a heat engine, said heat engine having a heat rejection circuit with means for receiving rejected heat from said heat engine, a primary heat exchanger connected to said means for receiving rejected heat, an evaporator in heat exchange relation with said primary heat exchanger, a heat engine indoor heat exchanger, a heat engine outdoor heat exchanger,

first fluid moving means for conducting a first fluid in series across both of said indoor heat exchangers,

second fluid moving means for conducting a second fluid in series across both of said outdoor heat exchangers,

means for drivingly interconnecting said heat engine with said compressor,

first valve means movable to a cooling position for discontinuing flow of vapor from said evaporator to said heat engine indoor heat exchanger when said heat engine is drivingly connected to said compressor,



second valve means movable to a heating position for discontinuing flow of vapor from said evaporator to said heat engine outdoor heat exchanger when said heat engine is drivingly connected to said compressor,

third valve means movable to a cooling position for connecting said compressor outlet to said refrigeration circuit outdoor heat exchanger when said first valve means is moved to said cooling position,

fourth valve means movable to a heating position for connecting said compressor outlet to said refrigeration circuit indoor heat exchanger when said second valve means is moved to said heating position.

4,178,773

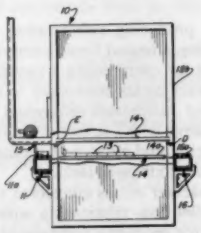
MATERIAL HANDLING SYSTEM

Alden H. Wakeman, Lake Mills, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.

Filed Mar. 24, 1978, Ser. No. 889,731

Int. Cl.[2] F25C *5/14*

U.S. Cl. 62—341 **6 Claims**



1. A material handling system for use in successively pushing a plurality of products between a pair of refrigerated plates

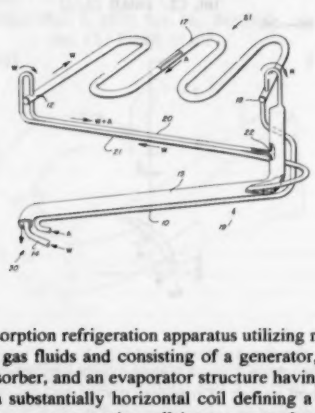
when the latter assume a predetermined separated substantially parallel relation, said system comprising a plurality of substantially rigid framelike members, each member being adapted to loosely encompass a predetermined number of products prior to the latter being fed between the pair of plates, each product and the encompassing framelike member moving substantially as a unit between the pair of separated plates, each member including an encompassing wall section having substantially planar exterior surface portions disposed substantially normal to the direction of travel of the product and member between the pair of plates, predetermined exterior surface portions of successive framelike members being in abutting relation while being moved between the pair of plates; the height of each wall section being at least substantially equal to the maximum height of the product encompassed thereby; said framelike members being successively removed from the products subsequent to said member and product being discharged from between the pair of plates.

4,178,774

ABSORPTION REFRIGERATION APPARATUS

Karl-Gosta Almén, Joinville, Brazil, assignor to Consul S. A., Joinville,, Brazil

Filed Sep. 1, 1978, Ser. No. 939,070
Claims priority, application Brazil, Sep. 8, 1977, 54509
Int. Cl.[2] F25B *15/10*
U.S. Cl. 62—493 **8 Claims**



1. In an absorption refrigeration apparatus utilizing refrigerant and inert gas fluids and consisting of a generator, a condenser, an absorber, and an evaporator structure having a first portion and a substantially horizontal coil defining a coldest portion and a warmest portion, all interconnected with one another, improved means for effecting a two-stage precooling of liquid refrigerant and weak refrigerant and auxiliary gas media in said apparatus, said means comprising:

means for effecting an initial precooling of the weak gas media and liquid refrigerant through heat exchange thereof with said first portion of the evaporator structure;

means for effecting a final precooling of the weak gas media by conducting the initially precooled weak gas media in heat exchange relationship with a tube through which flows liquid refrigerant and a portion of the initially precooled weak gas media and delivering the finally precooled weak gas media to said coldest portion of the evaporator coil;

means for introducing the initially precooled refrigerant to said warmest portion of said evaporator coil; and

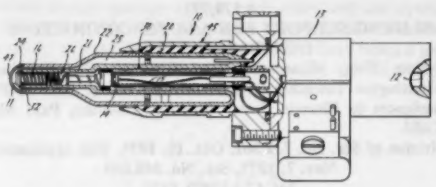
means for flowing said refrigerant from said warmest portion through said evaporator coil in countercurrent to the stream of weak gas media flowing through it from said coldest portion to said warmest portion.

4,178,775

CRYOSTAT ASSEMBLY

Daryl L. Smetana, West Covina, Calif., assignor to Ford Aerospace and Communications Corporation, Newport Beach, Calif.

Filed Sep. 18, 1978, Ser. No. 943,594
Int. Cl.[2] F25B *19/00*
U.S. Cl. 62—514 JT **12 Claims**



1. A cryostat assembly for an infrared detection device comprising:

a substantially electrically insulating interior wall member for defining at least a portion of the boundary of a recess adapted to contain a coolant such as, for example, nitrogen, said wall member having a cylindrical portion; and

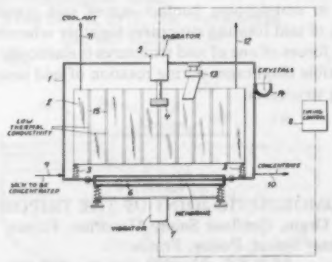
a cryostat means provided within said recess for guiding the coolant and having an exit nozzle for distributing the coolant from said cryostat means at a position adjacent said cylindrical portion and in a direction tangential to an adjacent portion of said cylindrical portion so as to reduce the force of impingement of the coolant on said cylindrical portion with respect to a radial impingement of the coolant on said cylindrical portion thus reducing noise sensed by the infrared detection device.

4,178,776

INTERMITTENT VIBRATION IN FRACTIONAL CRYSTALLIZATION

Wolfgang Baldus, Pullach, and Wilhelm Lehmer, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 2, 1977, Ser. No. 803,113
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625296; Jun. 4, 1976, 2625276
Int. Cl.[2] B01D *9/04*
U.S. Cl. 62—538 **16 Claims**



1. A method of concentrating a solution by the freezing of crystals of a solvent from the solution, said method comprising the steps of:

contacting said solution with at least one heat-exchange surface;

cooling said surface with a fluid coolant to a temperature below the freezing point of said solvent to freeze crystals of said solvent from said solution;

imparting relative vibratory movement to said surface and said solution; and

intermittently interrupting the relative vibratory movement of said surface and said solution to establish rest periods between intervals of such vibration, said relative vibratory motion being imparted to said solution and said surface by vibrating said surface and vibrating said solution independently and alternately.

4,178,777

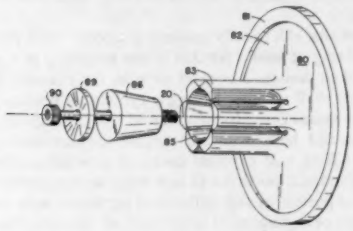
SLIDING SUPPORT FOR A SUPERCONDUCTING GENERATOR ROTOR

Sui-chun Ying, Monroeville, and Glen D. Cooper, North Huntington Township, Westmoreland County, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Division of Ser. No. 732,561, Oct. 15, 1976. This application Nov. 7, 1977, Ser. No. 848,849

Int. Cl.[2] F16D *3/78*

U.S. Cl. 64—13 **4 Claims**



1. A high speed rotating coupling including a flexible diaphragm member attached to a first end of said coupling; a plurality of axially disposed fingers defining outer contacting surfaces parallel to said axis intergrally attached to said flexible diaphragm, said fingers providing a rigid torsional connection to said diaphragm and extending axially of said rotating structures from the first end of said coupling toward the second end of said coupling; a member defining a corresponding plurality of spline receiving, axially extending slots for receiving fingers of said diaphragm attached to the second end of said coupling; means biasing said fingers relative to said axis with a force into said slots; said biased fingers received within said finger receiving slots to slide with excursion of one of said rotating structures with respect to the other of said rotating structures and to remain in non-slipping contact across said coupling during rotation of said rotating structures together whereby non-axial loading forces of one of said structures is elastically received at said flexible diaphragm during rotation of said inner and outer rotating structures.

4,178,778

HOMOKINETIC JOINT OF THE TRIPOD TYPE

Michel Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

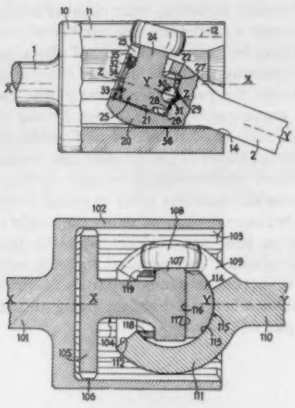
Filed Feb. 23, 1978, Ser. No. 880,489

Claims priority, application France, Mar. 4, 1977, 77 06428

Int. Cl.[2] F16D *3/30*

U.S. Cl. 64—21 **13 Claims**

1. A tripod homokinetic joint comprising a first shaft, a second shaft, a first member constituting a tripod and connected to the first shaft and defining three trunnions, three part-spherical rollers respectively rotatably mounted on the trunnions, and a second member connected to said second shaft and defining three raceways in which said rollers are respectively received, the tripod being distinct from the first shaft, and an auxiliary homokinetic coupling capable of operating at an angle of displacement which is small relative to the maxi-



mum angle of displacement of said first and second shafts connecting the tripod to the first shaft.

4,178,779

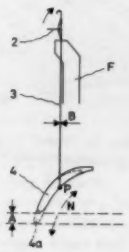
STITCH CAMS FOR CIRCULAR KNITTING MACHINES

Juan M. Schreiner, Barcelona, Spain, assignor to Jumberca, S.A., Spain

Filed Feb. 27, 1978, Ser. No. 881,368

Int. Cl.[2] D04B *15/32*

U.S. Cl. 66—54 **4 Claims**



1. In circular knitting machines having stitch cams and needles in which a stitch adjustment is effected by rotating a cam around an axis of rotation, the improvement wherein the main portion of an active portion of the cam is disposed along an arc having the same center as the axis of rotation of the cam, the angle of incidence and the point of closing of the needle latches on said main portion of the can active portion remaining constant for any position of the cam between the maximum and minimum stitch graduation.

4,178,780

NEEDLE BED FOR FLAT KNITTING MACHINE

Hans Maisel, Mistelbach, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 916,682

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728223

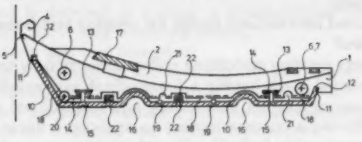
Int. Cl.[2] D04B *15/00*

U.S. Cl. 66—115 **9 Claims**

1. A needle bed for flat knitting machines of the type having a needle bed including a plurality of firmly compressed, laminated, plate-like webs, which plurality of webs includes relatively short webs, each of which form the base of a needle bed groove and relatively tall webs, each of which form the needle

bed web surfaces and which are arranged in a regularly alternate manner with said short webs, and said needle bed also including tightening means for pressing said plurality of webs together to form a solid pack, the improvement comprising:

said plurality of webs pressed together to form a solid pack having at least one longitudinal fitting groove formed therein; and



a trough-shaped sheet steel section which extends in the longitudinal direction of said needle bed and in which said solid pack is inserted and firmly clamped thereto, said trough-shaped sheet steel section having at least one fitting edge configured for mating receipt within said fitting groove of said solid pack, said fitting edge being fitted within said fitting groove so as to at least partially aid in the secure clamping of said pack to said trough-shaped sheet steel section.

4,178,781

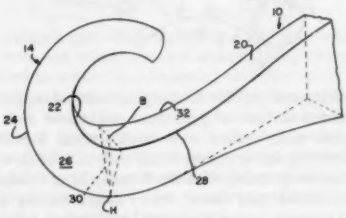
KNITTING NEEDLE

Douglas R. Virgilio, Winsted; Robert G. Campbell, Torrington; Alfred J. Fortunato, Torrington, and Carl F. Benson, Torrington, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Mar. 6, 1978, Ser. No. 884,016

Int. Cl.[2] D04B *35/04*

U.S. Cl. 66—121 **5 Claims**



1. A machine knitting needle having a blade and a hook, said hook having a curved inside surface and a curved outside surface, and shaped so that substantially more of the hook material is located nearer the curved inside surface of the hook than the curved outside surface of the hook so as to decrease the maximum stress levels generated in the hook when compared to conventional knitting needle hooks.

4,178,782

DEVICE FOR PRINTING BY SUBLIMATION

Günter Schiffer, Krefeld, Fed. Rep. of Germany, assignor to Kleinewefers Gesellschaft mit beschränkter Haftung, Krefeld, Fed. Rep. of Germany

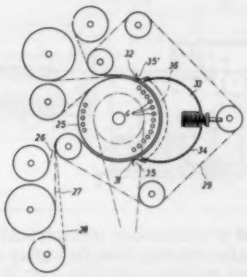
Filed Aug. 17, 1977, Ser. No. 825,427

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638128

Int. Cl.[2] B44C *1/16*; D06P *1/00*; D06B *1/14*

U.S. Cl. 68—5 D **5 Claims**

1. A device for printing in a continuous manner upon a web of textile material by sublimation of dyestuff, which includes in combination: a rotatable drum provided with heating means for heating the outer peripheral surface of said drum, pressure belt operable to pass around a portion of said peripheral surface of said drum and in spaced relationship to said peripheral surface so as to define with the latter a passage for receiving a dyestuff carrier adjacent to said peripheral surface and a web of textile material to be printed upon between said dyestuff carrier and said pressure belt, and roller means for supplying said dyestuff carrier and web of textile material into said passage and withdrawing same therefrom, said pressure belt being permeable to a gaseous substance and being operable to engage and press a web of textile material and a dyestuff carrier both received in said passage against each other and the dyestuff carrier against said outer peripheral surface of said drum and regionally at level of the peripheral surface there being a gaseous pressure differential effective peripherally thereof, a strong



pressing of the web of textile material being less important than that essentially dye gas generated during sublimation has the possibility freely and without material resistance to press out of the web of textile material an equal quantity of air absorbed by the web and thus unimpededly to penetrate into the web of textile material pressed against said dyestuff carrier merely at such a pressure that the web of textile material closely engages said dyestuff carrier and that dyestuff gas is kept from laterally escaping from the pattern so that blurring of the pattern is prevented, a protective belt permeable to a gaseous medium and extending between said drum and said pressure belt and directly engaged by the latter, and a vacuum chamber encompassing at least a section of that portion of said peripheral outer drum surface which is passed around by said pressure belt.

4,178,783

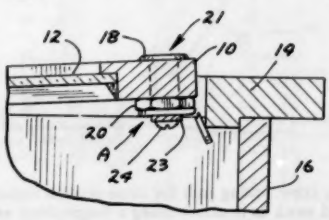
YIELDABLE LOCK LATCH FOR FIRE EXTINGUISHER CABINET

Walter F. Lee, Bloomington, Minn.

Filed Oct. 6, 1977, Ser. No. 839,826

Int. Cl.[2] E05B *15/16*

U.S. Cl. 70—422 **1 Claim**



1. A door latch for a fire extinguisher cabinet comprising in combination:

(a) an enclosure having a hinge mounted

(b) door,

(c) a lock mounted on said door and having,

(d) a latch extending therefrom and engageable with a portion of said enclosure to secure the door in a closed position upon the enclosure,

(e) said latch made of yieldable material whereby when said door is pulled outwardly of the enclosure said latch yields and bypasses said portion of said enclosure to allow an opening of said lock,

said yieldable latch constructed of frangible plastic.

4,178,784

METHOD FOR REMOVING PLATING RESIDUES FROM A PLATED WIRE

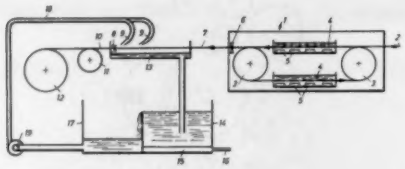
Asbjörn Storfossen, Drammen, Norway, assignor to Kabmatik AB, Vallingby, Sweden

Filed May 2, 1978, Ser. No. 902,087

Claims priority, application Norway, May 6, 1977, 771613

Int. Cl.[2] B21C *23/24, 43/02;* C25D *7/06*

U.S. Cl. 72—47 **7 Claims**



1. In a method of continuously electrolytically plating wire, an improvement for removing from the surface of the wire acid crystal and liquid residues originating from the plating bath, the improvement including the steps of: mechanically treating the surface of the wire to remove residue thereon, and supplying a non-aqueous liquid to the wire prior to said mechanical treating so that the wire undergoes such treating in the presence of the supplied liquid, the composition of the liquid and residues being such that said residues are not dissolved or emulgated in the liquid.

4,178,785

SKEW ROLLING MILL

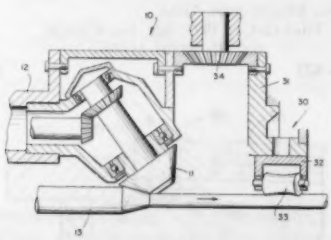
Eckhard Tuschy, and Georg Wischmeyer, both of Osnabruck, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,204

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712245

Int. Cl.[2] B21B *13/00*

U.S. Cl. 72—78 **3 Claims**



1. In a skew rolling mill for cross section reduction of an elongated stock as it moves along a longitudinal axis without rotation about such axis, comprising:

a roller support means mounted for rotation about said longitudinal axis;

a plurality of working rollers mounted within said roll support means and symmetrically about said longitudinal axis, each of said rollers being mounted for rotation about a secondary axis which intersects the elongated stock;

primary means for rotating said roll support means in a first direction; and

first intermediate means for rotating said rollers about said secondary axis and into the surface of said elongated stock for reducing the cross section of said stock, the improvement comprising:

a deforming means for smoothing helically shaped protrusions and grooves caused by said working rollers in the surface of the elongated stock, said deforming means including:

frame means adapted to be rotated about said longitudinal axis;

second intermediate means for rotating said frame means; and

freely rotating smoothing rollers supported by said frame means, each having a longitudinal axis angularly displaced and not intersecting said longitudinal axis, and having a concave surface to maintain a linear engagement with helically shaped protrusions and groove markings in the surface of said elongated stock caused by said working rollers.

4,178,786

NECKING-OUT TOOL FOR FORMING NECKS ON PIPES

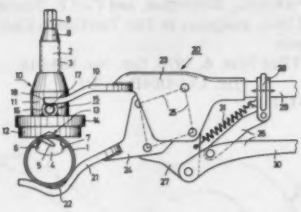
Karl Rothenberger, Walldorf,Hessen, Fed. Rep. of Germany, assignor to Rothenberger GmbH & Co., Frankfurt, Fed. Rep. of Germany

Filed Mar. 11, 1976, Ser. No. 666,118

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1975, 2511491

Int. Cl.[2] B21D *51/40*

U.S. Cl. 72—117 **8 Claims**



1. A necking-out tool for forming cylindrical nipples on the circumferential surface of pipelines, containers and the like having screw plug means with hook-shaped forming head means and thrust sleeve means fitted with coaxial downholder flange means cooperating with the forming head means and the screw plug means; said thrust sleeve means having a hollow cylindrical interior having a central longitudinal axis and corresponding to the forming head means for the reception of the formed neck, the improvement which comprises holding means comprising two pivotally connected jaws and means pivotally connecting one jaw to the downholder flange means and the thrust sleeve means such that they pivot parallel to the pivoting of the jaws and comprising a hinge pin disposed perpendicular to the longitudinal axis and at least adjacent thereto at the terminal end of said one jaw and wherein the other jaw forming a trough-shaped support diametrically opposite the hinge.

4,178,787

REMOTELY OPERATED TUBE EXPANDING TOOL AND SUPPORT

Kenneth S. Gerkey, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1978, Ser. No. 932,583

Int. Cl.[2] B21D *39/06*

U.S. Cl. 72—122 **5 Claims**

1. A tool and tool support means for attachment to and operation with remotely disposed and automatically operated apparatus for repairing the tubes and tube sheet of a steam generator, said apparatus having a generally horizontally extending member and means thereon for mounting said tool

support means for rotational movement in a plane above and generally parallel to said member and wherein said tool and tool support means do not project below any portion of said member so as to permit uninterrupted rotational positioning of said tool within said plane and wherein said tool support means comprises:

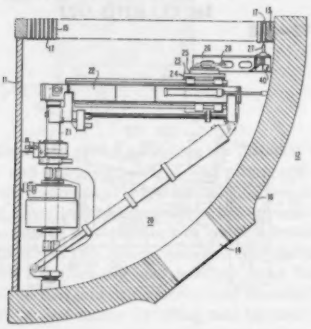
a generally horizontally projecting arm and means for attaching one end of said arm to said mounting means and wherein said arm is configured such that the opposite end thereof is disposed in a plane a predetermined vertical distance above said mounting means;

and wherein said tool comprises:

a tool head mounted on said arm adjacent said opposite end and having an upwardly projecting collar member, a mandrel projecting vertically therethrough and supported therein for rotational and vertical movement;

a drive motor and means for supporting said motor on said arm generally horizontally between said one end and said opposite end thereof;

a flexible drive mechanism for connecting the drive of said horizontal motor to said vertical mandrel, said mechanism



comprising a gear drive including a first gear attached to the lower end of said mandrel and engaging a second gear attached to means for connecting said gear to said motor, said first and second gears rotationally mounted in a housing, and means for supporting said housing generally below said opposite end of said arm for guided vertical movement between a lowermost position above the plane of said horizontally extending member of said apparatus and an elevated position for elevating said mandrel of said tool head as required by said tool;

means interconnected between said arm and said housing for raising and lowering said housing in accordance with a predetermined operation sequence and wherein said flexible drive means permits vertical movement of said gears while said motor remains at a constant horizontal plane;

means for moving said motor in said horizontal plane between an at-rest rearward position and activated forward position, in accordance with a predetermined operation sequence; and

means for controlling the operation of said motor, said lift means and motor moving means to effect operation of said tool.

4,178,788

ADJUSTABLE CLAMP DIE

Richard T. Zollweg, Garden Grove, and Homer L. Eaton, Leucadia, both of Calif., assignors to Eaton-Leonard Corporation, Carlsbad, Calif.

Filed Mar. 24, 1978, Ser. No. 889,863

Int. Cl.[2] B21D *7/04*

U.S. Cl. 72—154 **5 Claims**

1. A rotary bending machine comprising,

a support

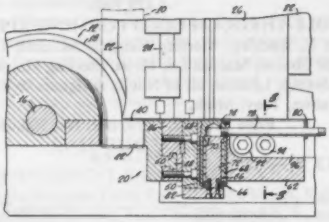
a swinging bend arm assembly mounted on said support for rotation about a bend axis, said swinging bend arm assembly including

a bend die having a fixed member adapted to engage a pipe pressed by a clamp die,

a bend arm slide mounted for motion substantially radially of said bend die,

a slide holder secured to said bend arm slide,

a clamp slide carrying a clamp die and mounted to said slide holder for tangential motion parallel to a tangent to said bend die, said clamp slide being mounted for cooperation with and for said tangential motion relative to said fixed bend die member between a first position in which the clamp die is directly opposed to said fixed bend die mem-



ber, so as to press a pipe directly against said fixed bend die member, and a second position in which the clamp die is shifted forwardly of said bend die fixed member, forwardly of said bend arm slide, and forwardly of a pipe positioned at said bend die, so as to press a pipe against said fixed member and exert a force thereon having an increased moment arm about said bend axis, said clamp die being movable along a pipe positioned against said fixed bend die member either forwardly toward or rearwardly from a previously made bend in the pipe according to the relation between the length of said clamp die and the distance between bends,

means for rotating said swinging bend arm assembly, and

a pressure die for pressing against a pipe to be bent.

4,178,789

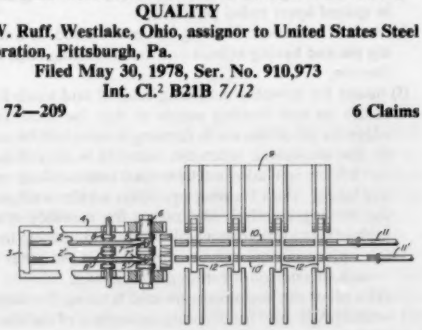
SIMULTANEOUS PLUG-MILL ROLLING FOR INCREASED PRODUCTION AND ENHANCED TUBE QUALITY

James W. Ruff, Westlake, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 30, 1978, Ser. No. 910,973

Int. Cl.[2] B21B *7/12*

U.S. Cl. 72—209 **6 Claims**



1. In the production of seamless tubing, wherein shells are transferred to a plug rolling mill to receive a rolling operation consisting of at least two plug-rollng passes, each of said rolling passes consisting of pushing the shell over a plug attached to a supported mandrel bar, said plug lying within a first roll groove of the work rolls of said rolling mill, drawing said shell over the plug by the rolling friction of the roll groove, removing the plug and reversing the travel of the shell so as to strip

it from the plug, thereafter repeating the rolling procedure for at least one additional pass in the same roll groove,

the improvement for significantly increasing the production rate of said plug rolling operation, which comprises,

(a) after completion of the first pass, and without removal of the mandrel bar from its support, laterally transferring the first shell to position for effecting the second pass in a second roll groove of the same roll,

(b) moving a second shell into position for effecting a first pass thereon in said first roll groove, and

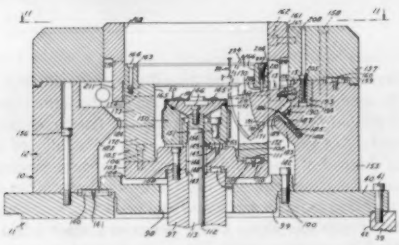
(c) simultaneously pushing said second shell and said first shell through said first and second roll grooves, respectively.

4,178,790

ROLL-THROUGH COLD FORMING APPARATUS

James E. Buckley, Sterling Heights; Mitchell E. Bartold, St. Clair Shores; Marshall S. Heist, Sterling Heights, and James L. Jessup, Livonia, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed May 22, 1978, Ser. No. 908,033
Int. Cl.[2] B21D *51/12*
U.S. Cl. 72—224 **16 Claims**



1. In a roll-through cold forming apparatus for forming teeth on a workpiece, the combination comprising:

(a) a housing means;

(b) a tooth forming mandrel for carrying a workpiece;

(c) means for movably mounting said tooth forming mandrel on said housing means for movement along the longitudinal axis of the mandrel;

(d) a plurality of tooth forming blades disposed in a circle about the longitudinal axis of said tooth forming mandrel, in spaced apart radial positions;

(e) each of said tooth forming blades mounted on a supporting pin and having at least one tooth forming edge formed thereon;

(f) means for movably mounting each of said tooth forming blades on said housing means so that the tooth forming edges on all of the tooth forming blades will be engaged by the workpiece when the mandrel is moved past the tooth forming blades and be moved into a rolling, material displacing, tooth forming operation on the workpiece by the moving mandrel; said means for movably mounting each of said tooth forming blades on said housing includes:

(1) a pivot pin operatively mounted on the other end of each of said tooth forming blades; and,

(2) a pivot pin seat means on said housing for supporting said pivot shaft for pivoting movement of the blade; said pivot pin seat means comprises:

A. a pivot pin seat block having an arcuate seat formed thereon for receiving said pivot pin for pivotally seating said pivot pin;

B. spring means on said housing for biasing said pivot pin into a pivoting seating engagement on said arcuate pivot seat;

C. adjustment means mounted on said housing for adjusting said pivot pin seat block toward said mandrel against the action of said spring means for adjusting the depth of teeth formed on a workpiece on said mandrel; said adjustment includes:

I. an adjustable gib engagable with the seat block for moving it toward said mandrel; and

II. screw means for adjusting an adjustable gib;

(g) means for stripping a finished workpiece from said mandrel after a teeth forming operation on said workpiece, and for loading a new workpiece on the mandrel; and

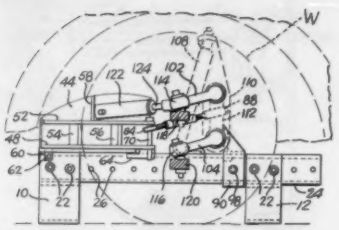
(h) resiliently biased pin means on said housing for each of said tooth forming blades for allowing each blade to be moved to a position to permit the mandrel and a workpiece thereon to move past the blade in one direction to an initial position for a teeth forming operation, and return the blade to an initial workpiece engaging position after said movement of each blade to its initial position.

4,178,791

METHOD AND APPARATUS FOR CORRECTING BENT AXLE MISALIGNMENT

Danny O. Daniel, Rte. 3, Box 57A, Blackfoot, Id. 83221

Filed Feb. 25, 1977, Ser. No. 772,294
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—388 **25 Claims**



1. Apparatus, which comprises:

means for clamping an axle assembly of a vehicle having an inner wheel housing;

hydraulic jack means operatively coupled to said clamping means for bending said axle assembly while installed in said vehicle; and

means for supporting said hydraulic jack means, said means for supporting comprising base means adapted to be positioned underneath said axle assembly, said means for supporting further comprising breast plate means pivotally coupled to said base means;

wherein said breast plate means includes means for supporting the base of said hydraulic jack means such that the latter means is disposed substantially horizontally in use and an outer, vertically oritented wall that is curved congruently to the inner wheel housing against which said breast plate means is positioned during use.

4,178,792

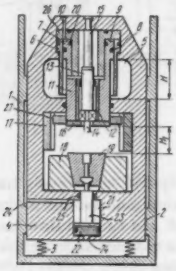
HIGH-SPEED ANVILLESS HAMMER

Petr P. Matviets, ulitsa Lizjukova 43, kv. 167; Iosif L. Makhtjuk, prospekt Truda 60, kv. 11; Valentin I. Grigoriev, ulitsa Pushkinskaya 36, kv. 73; Mark M. Zaidlin, ulitsa Geroev Sibiryakov 24, kv. 158, all of, Voronezh; Alexandr I. Khotilin, ulitsa Novo-Sadovaya 15, kv. 21, Kuibyshev; Jury N. Krasnov, ulitsa Fizkulturnaya 129, kv. 35, Kuibyshev, and Isaak R. Khaimovich, ulitsa Juria Pavlova 3, kv. 8, Kuibyshev, all of U.S.S.R.

Filed Apr. 18, 1978, Ser. No. 897,265
Int. Cl.[2] B21J *7/28*
U.S. Cl. 72—436 **5 Claims**

1. A high-speed anvilless hammer comprising: a bed; guides provided on said bed; a frame supported on cushions and mounted in said bed guides; a hammer head mounted on said frame; a working tool mounted on the lower end of said ham-

mer head; a die block mounted underneath said working tool; a drive for imparting an axial reciprocating motion to said hammer head so that said hammer head moves between an initial position and a work position, in which the working tool strikes a workpiece, said drive being constructed in the form of a power chamber with a working medium contained therein and a power cylinder with a piston and a piston rod; retention means for retaining said hammer head in the initial position; said piston rod having a central guide hole which is situated in the piston rod portion nearest the die block, is sealed at the end nearest said power chamber and accommodates said hammer



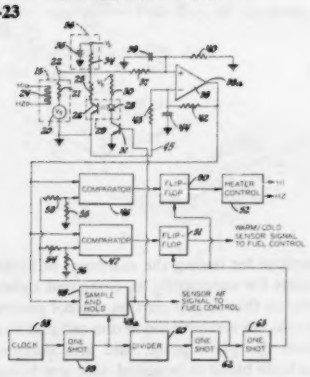
head; the stroke of said piston exceeding the distance between said die block and the lower end of said piston rod, due to which, when the piston is in a lowermost position, a closed zone is formed around said hammer head between said piston rod and the surface of said die block in which zone deformation of the blank is effected; means operative after formation of the closed zone for releasing said hammer head from said retention means so that said drive moves said hammer head to said work position; and means for lifting said hammer head to the said retention means after the working tool strikes a workpiece.

4,178,793

APPARATUS FOR OXYGEN SENSOR IMPEDANCE MEASUREMENT

Richard J. Bremer, Grand Blanc, and Daniel J. Richardson, Swartz Creek, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 5, 1978, Ser. No. 939,465
Int. Cl.[2] G01N *27/46*
U.S. Cl. 73—23 **1 Claim**



1. In combination with a vehicle engine exhaust mounted oxygen sensor of the type having a pair of output terminals with a variable internal impedance across said terminals and being effective to generate an output signal voltage across said terminals, apparatus for measuring said internal impedance, comprising:

a test impedance;

a semiconductor switch connected in series with said sensor and said test impedance, the semiconductor switch being characterized by an internal impedance which may increase greatly with low current therethrough;

a constant current source connected to supply a constant electrical current to the one sensor terminal, said constant current source being effective to provide current through the reference impedance and semiconductor switch when the sensor internal impedance becomes large;

first means effective to sense and store the magnitude of the voltage at the one sensor terminal with the semiconductor switch not conducting;

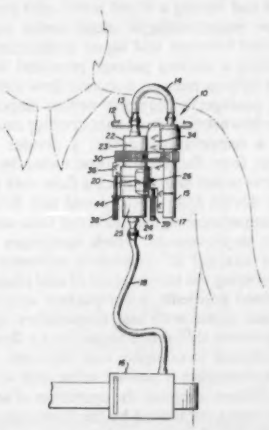
second means effective to sense the magnitude of the voltage at the one sensor terminal with the semiconductor switch conducting for comparison with the magnitude stored in the first means, the ratio of said magnitudes varying with and thus indicating said sensor impedance.

4,178,794

ENVIRONMENTAL SAMPLING DEVICE

Lawrence C. Jugle, Niagara Falls; Emil R. Inderbitzen, Eggertsville, and Paul W. McDaniel, Port Chester, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,190
Int. Cl.[2] G01N *1/22*; B01D *46/10*
U.S. Cl. 73—28 **1 Claim**



1. In combination with a portable means for providing a flow of dust laden air, a portable sampling device adapted for attachment to a worker's apparel for receiving a flow of dust laden air from said portable means and collecting air-borne dust samples therefrom, said portable sampling device comprising a first housing member having an inlet for receiving a dust laden air sample, a chamber communicating with said inlet and an annular recessed end portion opposite said inlet said chamber having a length which is about **13** times the diameter of said inlet and an inner diameter which is about **6.75** times the diameter of said inlet; a second housing member arranged adjacent to and in-line with said first housing member having an annular recessed portion adjacent the recessed portion of said first housing member to define an annular groove, a chamber within said second housing member having a length about **35%** shorter than the length of the chamber of said first housing member communicating with the chamber of said first housing member, and an outlet; a closely engaging pair of ring-shaped members arranged in said annular groove; and a dust collecting membrane being supportably engaged only peripherally between said ring-shaped members, the diameter

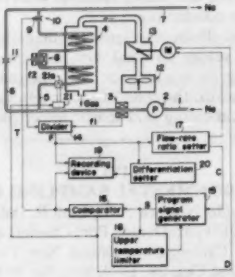
of the inner surfaces of said chambers and said ring-shaped members being essentially the same so as to provide a smooth surfaced passageway.

4,178,795

PLUGGING METER

Akinori Nagai, Higashi, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,678
Claims priority, application Japan, Sep. 22, 1976, 51-113937
Int. Cl.[2] G01N *11/00*
U.S. Cl. 73—61 LM **7 Claims**



1. In a plugging meter for measuring impurity concentration in a liquid metal and having a liquid metal inlet pipe provided with a first flow meter, a liquid metal outlet pipe, parallel passages connected between said liquid metal inlet and outlet pipes and including a cooling passage provided with cooling equipment and a by-pass passage, a second flow meter disposed in said cooling passage, a plugging orifice disposed in said cooling passage downstream from said cooling equipment and equipped with a temperature sensor, a divider adapted to divide the output from the second flow meter by the output from the first flow meter and produce a flow-rate ratio signal, and a recording device adapted to record said flow-rate ratio signal and the temperature signal delivered from said temperature sensor, the improvement which comprises a program signal generator adapted to transmit a reference signal for elevating and lowering the temperature of said plugging orifice with predetermined gradients, a comparator adapted to compare said reference signal with said temperature signal and to produce a temperature difference signal, and a flow-rate ratio setting device adapted to compare said flow-rate ratio signal with a signal representing a pre-set value and to produce a flow-rate ratio difference signal, the operation of said program signal generator being controlled by the flow-rate ratio difference signal from said flow-rate ratio setting device, and the operation of said cooling equipment being controlled by said temperature difference signal so as to control the temperature of said plugging orifice.

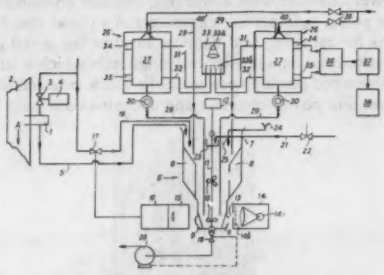
4,178,796

METHOD AND APPARATUS FOR PARTICLE SIZE ANALYSIS

James D. Zwicker, and Ghyslain Dube, both of Arvida, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed May 4, 1978, Ser. No. 902,689
Claims priority, application United Kingdom, May 9, 1977, 19433/77
Int. Cl.[2] G01N *15/04*
U.S. Cl. 73—61.4 **24 Claims**

1. A particle size analyser comprising a sequential sampler for periodically collecting a sample of a material to be analysed flowing along a line, a mixing tank for separately and sequentially receiving said samples, said mixing tank having means for automatically diluting each samle to a predetermined concentration, a sedimentation cell in which analysis of each individual sample by sedimentation is performed, a first fluid flow line leading from the mixing tank to the bottom of the sedimentation cell, and a second fluid flow line leading from the top of the sedimentation cell to the mixing tank, and means, including



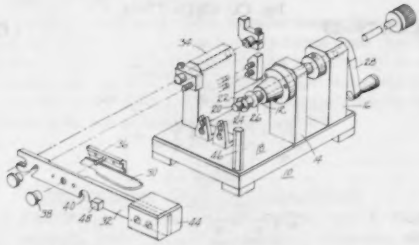
a pump, for separately and successively transferring a diluted sample from the mixing tank around a closed loop including the sedimentation cell and its fluid flow lines and for draining each sample from the sedimentation cell when the analysis of that sample is complete.

4,178,797

SHARPNESS TESTING MACHINE

George J. Kozlowski, Jr., Billerica, Mass., assignor to Rudolph Beaver, Inc., Belmont, Mass.

Filed Jan. 4, 1978, Ser. No. 866,849
Int. Cl.[2] G01M *13/00*
U.S. Cl. 73—104 **4 Claims**



1. A machine for testing the sharpness of knife blades comprising means for supporting an elongated cylindrical rod of test material so that an end portion thereof protrudes from the support means, an arm pivoted at one end and having a weight spaced from the pivot point, said arm carrying means for retaining a knife blade to be tested, said arm being pivoted in a plane perpendicular to the axis of the rod and so positioned that when the arm with a retained test blade is lowered toward the rod, the cutting edge of the blade rests on the periphery of the protruding end portion of the rod with a predetermined force, and means for rotating the rod so that the cutting edge of the blade cuts into the surface of the rod.

4,178,798
METHOD AND APPARATUS FOR MEASURING FUEL CONSUMPTION IN INTERNAL COMBUSTION ENGINES

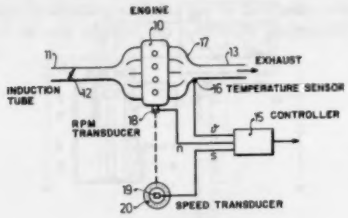
Wolf Wessel, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1978, Ser. No. 940,410

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757180

Int. Cl.[2] **G01L** *3/26;* **G01M** *15/00*

U.S. Cl. 73—113 **10 Claims**



2. An apparatus for measuring relative fuel consumption in an internal combustion engine, comprising:

an exhaust gas temperature transducer disposed in the exhaust manifold of the engine, for generating a first signal related to exhaust gas temperature;

an engine speed tachometer for generating a second signal related to the rotational speed of the engine (rpm);

timer means, connected to said tachometer to receive said second signal for actuation and connected to said transducer to receive said first signal for controlling the timing characteristics, for generating an output signal; and

display means for processing and displaying said output signal as representing relative fuel consumption per unit time.

4,178,799
FORCE AND BENDING MOMENT SENSING ARRANGEMENT AND STRUCTURE

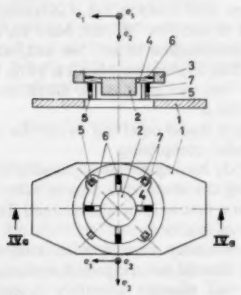
Lothar Schmieder, Gilching; August Vilgertshofer, Oberpfaffenhofen, and Florian Mettin, Eichenau, all of Fed. Rep. of Germany, assignors to Deutsch Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Linder Höhe, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,064

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727704

Int. Cl.[2] **G01L** *1/22*

U.S. Cl. 73—141 A **15 Claims**



1. Force and bending moment sensing arrangement having a base plate (1) and a load support plate (2) to determine loading and bending stresses applied between the base plate and the load support plate, and further comprising:

a coupling element (3);

at least three parallel support posts (5) of equal length connected to and positioned between one of said plates and the coupling element (3) and supporting the coupling element spaced from said one plate, said posts being both rigidly secured to said one plate and to the coupling element;

at least three support spokes (4) rigidly secured to said coupling element (3) and to said other plate and running therebetween with the spoke axes lying substantially in a single plane,

whereby said base plate (1) and said load support plate (2) are held together by a rigid post-coupling element-spoke connection system;

and bending deformation sensing means (6, 7) associated with each of said posts (5) and said spokes (4) and providing output signals representative of bending deformation of said respective posts and spokes.

4,178,800
METHOD OF AND APPARATUS FOR THE MEASURING OF QUANTITIES OF HEAT

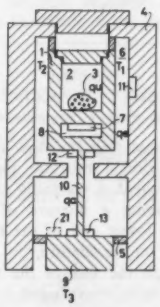
Christoph Thomann, Pfannenstielstrasse 7, CH-8132 Egg, Switzerland

Continuation-in-part of Ser. No. 819,058, Jul. 26, 1977, abandoned. This application May 22, 1978, Ser. No. 908,371

Claims priority, application Switzerland, Sep. 22, 1976, 11988/76

Int. Cl.[2] **G01K** *17/00*

U.S. Cl. 73—190 R **8 Claims**



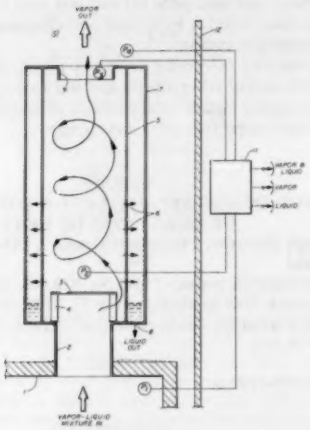
1. An apparatus for measuring an unknown heat quantity comprising: a vessel formed of a material having good heat conducting properties and heat-insulated relative to the environment and intended for receiving an unknown heat source, a known heat source associated with said vessel, a cold source connected with the vessel by way of a heat-conducting element, a first heat sensor located outside of said vessel for measuring a temperature T_2 of the vessel adjacent a connection between said vessel and said heat-conducting element, and a second heat sensor located outside of the cold source for measuring a temperature T_3 of the cold source adjacent a connection between said heat-conducting element and said cold source, a third heat sensor for measuring the temperature of the environment and an electrical control device for controlling the known heat source and the cold source by way of the heat sensors in such a manner that the temperature of the vessel is maintained equal to a temperature T_1 of the environment of the vessel in response to the difference sensed between the temperatures T_1 and T_2 and at the same time the difference between the temperature of the vessel and the temperature of the cold source is maintained the same in response to the difference sensed between T_3 and T_1.

4,178,801

MEASUREMENT OF GAS-LIQUID FLOW

Don S. Cassell, and Brice W. Kinyon, both of Chattanooga, Tenn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 10, 1978, Ser. No. 950,183
Int. Cl.[2] G01F *1/34;* B01D *45/16*
U.S. Cl. 73—195 3 Claims



1. A system for measuring the flow of vapor and liquid phases through a centrifugal separator, including,

a cylindrical tube, which is vertically oriented,

means for introducing a mixture of liquid and vapor mounted on the lower end of the tube and creating a centrifugal force on the mixture,

perforations through the side of the tube to function as passages for the liquid centrifuged to the internal wall of the tube,

a restrictive structure mounted on the upper end of the tube for the flow of the vapor from the tube,

a first pressure sensor mounted to respond to the pressure upstream of the tube,

a second pressure sensor mounted to respond to the pressure downstream of the tube,

an instrument station connected to both pressure sensors to respond to the differentials of their inputs to the station in terms of total flow of vapor and liquid through the tube,

a third pressure sensor mounted within the cylindrical tube responding to the pressure of the separated vapor flowing to the restrictive structure,

a fourth pressure sensor mounted in the cylindrical tube so as to respond to the lowest pressure developed by the restrictive structure, and

connections between the third and fourth pressure sensors and the instrument station to manifest differentials between the outputs of the third and fourth pressure sensors in terms of the flow of the vapor,

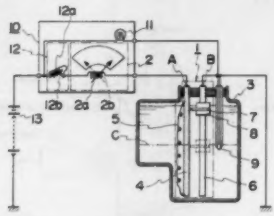
whereby the arrangement within the control station automatically manifests the flow of vapor and flow of liquid separately.

4,178,802

APPARATUS FOR INDICATING QUANTITY OF FUEL OF A VEHICLE

Harushige Yamamoto, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 890,948
Claims priority, application Japan, Apr. 20, 1977, 52/49807[U]
Int. Cl.[2] G01F *23/10*
U.S. Cl. 73—313 10 Claims



1. An apparatus for indicating the quantity of liquid in a container, comprising:

(1) a gauge adapted to indicate the quantity of liquid, the gauge having a first side connected in electrical circuit with a power source and a second side connected in electrical circuit with a variable resistance device;

(2) a variable resistance device comprising:

(a) a resistance means having a first end connected in electrical circuit with the gauge, the resistance means having a point near the first end short-circuited to a point near a second end thereof;

(b) a float responsive to the liquid level in the container; and

(c) a contact means responsive to the float and further connected in electrical circuit with the resistance means and with a source of reference potential,

whereby in operation the gauge indicates liquid quantity in response to changes in resistance in the variable resistance device, such changes including at least one non-linear change in resistance occurring at a predetermined liquid level thereby causing a reciprocal displacement in the gauge; and

(3) a warning indication means connected in electrical circuit with the power source and with a detector switch means responsive to the predetermined liquid level, whereby a warning indication occurs when the predetermined liquid level is reached.

4,178,803

PIPETTING DEVICES

Thomas E. Lee, 3938 Canyon Rd., Lafayette, Calif. 94549

Continuation of Ser. No. 797,285, May 16, 1977, abandoned, which is a continuation of Ser. No. 662,942, Mar. 1, 1976, abandoned. This application May 11, 1978, Ser. No. 904,925
Int. Cl.[2] B01L *3/02;* G01F *13/00*
U.S. Cl. 73—425.6 2 Claims

1. A precision liquid pipetting device for use with a disposable pipette tube, comprising

a tubular body having means adjacent a first end thereof for supporting the disposable pipette tube inserted coaxially therein in a precisely predetermined fixed position longitudinally of said body,

a plunger assembly coaxial with said tubular body and mounted therein for reciprocal movement longitudinally thereof, said plunger assembly extending beyond said tubular body and into the disposable pipette tube inserted therein,

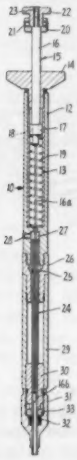
a cylindrical plunger tip carried on one end of said plunger assembly within said tubular body, said plunger tip having

an external diameter substantially equal to the internal diameter of the disposable pipette tube,

a finger button removably connected to the other end of said plunger assembly externally of said tubular body and opposite that of said plunger tip, said finger button having a sleeve extending longitudinally of said plunger assembly,

a removable end cap mounted on said tubular body at the end thereof opposite said first end and having a passageway therethrough through which said plunger assembly extends in sliding engagement,

a first stop slidably mounted on said sleeve of said finger button for abutting said end cap to determine one limit of travel of said plunger tip within the disposable pipette tube,



means for fixedly clamping said first stop at selectable positions longitudinally of said sleeve of said finger button, and

a second stop fixedly attached to said plunger assembly within said tubular body for abutting said end cap to determine a second limit of travel of said plunger tip; whereby said finger button and first stop, as a unit, may be removed from and resecured to said plunger assembly, allowing said volume end cap to be removed and substituted with another volume end cap, a predetermined gauged distance being maintained between the first stop and a substituted volume end cap while said second stop abuts against said end cap.

4,178,804

PRESSURE TRANSDUCERS

Peter N. Potter, Ewshot, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Jul. 31, 1978, Ser. No. 929,396

Claims priority, application United Kingdom, Aug. 12, 1977, 33829/77

Int. Cl.[2] G01L *11/00*

U.S. Cl. 73—702 **12 Claims**

1. A pressure transducer comprising:

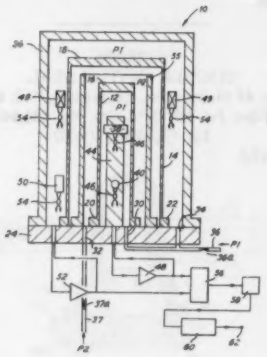
first and second similar hollow resonantly vibratable bodies whose respective resonant frequencies vary in dependence upon the difference in fluid pressure inside and outside the respective body, each of said bodies comprising a right cylinder integrally closed at one end and open at the other end,

base means for sealingly closing the respective said other ends of the cylinders,

casing means enclosing the cylinders,

means for exciting and maintaining resonant vibrations of the cylinders and for producing respective output signals representative of said resonant frequencies, and

means for applying a first fluid pressure to the inside of the first cylinder and to the outside of the second cylinder and for applying a second fluid pressure to the inside of the second cylinder and to the outside of the first cylinder, whereby said resonant frequencies vary in opposite senses in dependence upon the difference between first and second pressures, and the difference between said resonant frequencies, as represented by said output signals, is dependent upon said pressure difference, wherein the fluid pressure applying means comprises at least a first inlet conduit in said base means for applying said first fluid pressure to the inside of the first cylinder and a second inlet conduit in said base means for applying said second fluid pressure to the inside of the second cylinder.



4,178,805

STARTERS FOR INTERNAL COMBUSTION ENGINE

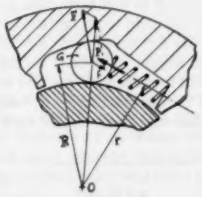
Alfred Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyons, France

Filed Jan. 11, 1978, Ser. No. 868,635

Claims priority, application France, Jan. 17, 1977, 77 01827

Int. Cl.[2] F02N *15/06;* F16D *41/06*

U.S. Cl. 74—6 **2 Claims**



1. A starter gearing adapted to be mounted on the end of the shaft of an electric motor to cooperate with a toothed ring carried by the flywheel of an internal combustion engine, the said shaft having a splined portion followed by a smooth portion, said gearing comprising:

a pinion having a smooth axial bore, said pinion carrying a co-axial lateral outwardly cup-shaped member formed with inwardly opening chambers each having an outer wall at a small angle with respect to the corresponding radii, with said member thus constituting the outer casing of an overrunning clutch of the spring-pressed roller type;

a sleeve having inner ribs, one end of said sleeve being disposed in said cup-shaped member with the periphery of said one end forming the inner race of said clutch;

means to axially retain said sleeve and said pinion with respect to each other;

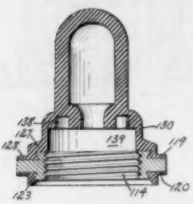
rollers each disposed within each one of said chambers;
and springs each disposed in one of said chambers to urge the corresponding roller towards a position at which it simultaneously engages said inner race and the outer wall of said one of said chambers;
said sleeve having a smooth axial bore portion at said one end and said pinion being formed with a tubular extension which is rotatably received within said smooth axial bore portion to center said outer casing with respect to said inner race.

4,178,806

TOGGLE SWITCH SEAL

Milton Morse, 44 Honeck St., Englewood, N.J. 07631

Filed Jul. 10, 1974, Ser. No. 486,961
Int. Cl.[2] F16J *15/50*
U.S. Cl. 74—17.8 **5 Claims**



1. In a toggle switch seal of a type performing an hermetic seal about an opening in a panel surface in which a switch having a movable toggle is positioned, said toggle switch seal including a nut element and a molded boot element surrounding said nut element, said boot element including a lower sealing member adapted to surround an opening in said panel surface and abut the same, and a toggle encircling member adapted to flex relative to said nut member with movement of said toggle, the improvement comprising: said toggle encircling member including a relatively thick-walled base abutting a planar end surface of said nut element, a relatively thin-walled intermediate portion extending longitudinally outwardly of the axis of said nut element and defining a cylindrical chamber interconnected to said base, a relatively thick-walled upper portion connected to said intermediate thin-walled portion, said upper portion defining an axially disposed bore communicating with said chamber, and an annular groove coaxially disposed with respect to said bore, said groove forming an annular area of relatively thin cross section in said upper member; whereby upon the flexing of said boot element by movement of an engaged toggle, said boot element tends to fold about said thin-walled intermediate portion and said last-mentioned annular area on one said thereof, with a minimum of distortion of the relatively thick-walled base and upper portion.

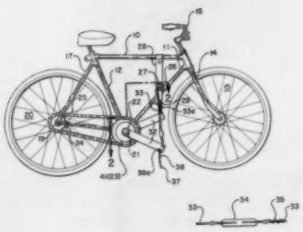
4,178,807

ADAPTER FOR RECIPROCAL LEVER FRICTION DRIVE MECHANISM FOR UNIDIRECTION DRIVE

Timothy T. J. Young, 788 Walnut St., Apt. 2, San Carlos, Calif. 94070

Continuation-in-part of Ser. No. 628,074, Nov. 3, 1975, Ser. No. 739,351, Nov. 5, 1976, Pat. No. 4,117,915, and a continuation-in-part of Ser. No. 810,948, Jun. 29, 1977. This application Oct. 11, 1977, Ser. No. 840,970
The portion of the term of this patent subsequent to Mar. 10, 1995, has been disclaimed.
Int. Cl.[2] F16H *11/00*
U.S. Cl. 74—217 B **1 Claim**

1. In an occupant propelled vehicle including a frame, a ground engaging wheel mounted on said frame, a driven sprocket for rotating said wheel, a drive sprocket, and an endless sprocket chain trained over said drive and driven sprockets, a drive shaft freely journaled concentric to said drive sprocket, a first lever arm disposed rotatable on one end of said shaft, a second lever arm disposed rotatable on the other end of said shaft; an attachment shaft journaled on said frame, a first cable having one end attached to the tip of one of said lever arms and the other end wound clockwise on said attachment shaft, and a second cable having one end attached to the tip of the other of said lever arm, and the othr end wound counterclockwise on said attachment shaft, and a turnbuckle with right-and-left threaded screws fitted to each of said cable whereby the cable length may be adjusted, and a compression spring mounted on said turnbuckle for moving into stopping engagement with said attachment shaft to limit the travel of said cables, and a leverage adding weight suspend from the tip of each of said lever arms by a link chain; and comprising a reciprocal lever friction drive mechanism for a man-powered



vehicle, said mechanism consists of the first elements disposed keyed to both ends of the said drive shaft, each first element having cylindrical friction engagement means thereon; and a second element disposed contiguous and coaxial with each of the first element and rotatably relative thereto; a plurality of members connected to the second element adapted to frictionally engage and disengage the cylindrical friction engagement means and relative rotation of the second element in one direction causes engagement of the friction engagement, and opposite relative rotation causes disengagement of the friction engagement; and create a rotation of the drive shaft and simultaneously create a rotation of the sprocket wheel;
characterized by the adaptability of the drive mechanism to a manpowered propelled vehicle by fitting the mechanism to each end of the common driving shaft on which transmission of power generated is effected.

4,178,808

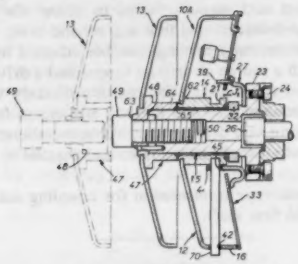
SHEAVE FOR A SPEED VARIATOR AND A METHOD OF REPLACING A BELT THEREON

Michel Bacher, Garges-les-Gonesse, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Dec. 22, 1977, Ser. No. 863,239
Claims priority, application France, Dec. 31, 1976, 76 39743
Int. Cl.[2] F16H *55/52, 55/56;* **F16F** *1/34;* **B23P** *19/04*
U.S. Cl. 74—230.17 E **21 Claims**

1. A sheave for a speed variator of the kind comprising a shaft, two coaxial sheave sides facing each other including a movable side mounted for sliding movement on said shaft and rotation with said shaft, and a fixed side also fixed for rotation with said shaft, joined in operation to said shaft against axial movement and adapted to be dismounted with respect to both said shaft and said movable side, said fixed side having an axially extending hub and a retaining shoulder, a screw fastener normally effectively bearing axially against the retaining shoulder for securing said hub at an end of said shaft, and resilient biasing means normally urging said movable side towards said fixed side, wherein the improvement comprises: a thrust shoulder on said hub adapted to effectively bear against

said movable side once the fixed side has been dismounted and, turned around, and a bearing shoulder also on said hub against which said screw fastener is adapted to bear once said fixed



side has been turned around, releasable retaining means coacting with means fixed axially with respect to said shaft so as to axially retain the movable side temporarily against biasing force exerted thereon by said resilient biasing means.

4,178,809

MODE CHANGE-OVER DEVICE FOR RECORDING AND/OR REPRODUCING APPARATUS

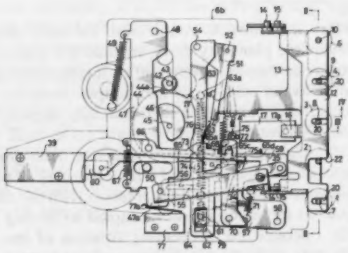
Hisashi Hanzawa, and Kozi Yoshino, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,428

Claims priority, application Japan, Mar. 17, 1977, 52-33180[U]

Int. Cl.[2] G05G *1/02, 5/08;* G11B *15/10*

U.S. Cl. 74—483 PB **10 Claims**



1. A mode change over device for a recording and/or reproducing apparatus comprising a plurality of push buttons corresponding to a selected one of a plurality of operating modes of said recording and/or reproducing apparatus, mode selecting means movable to a selected one of a plurality of positions in accordance with the selective actuation of one of said plurality of push buttons, mode change over means selectively movable from a first rest position to a plurality of operative positions corresponding to movement of said mode selecting means to one of said plurality of positions, a plurality of mode selecting levers and a drive mechanism including drive means for said drive mechanism to selectively drive said drive mechanism through predetermined degrees of angular rotation to move said mode change over means from said rest position to one of said plurality of operating positions thereby to move selected ones of said mode selecting levers from a first inoperative position to a second operative position to effect mode change in said recording and/or reproducing apparatus corresponding to the operative mode selected by the particular push button which has been activated.

4,178,810

APPARATUS FOR MANIPULATING A MEDICAL INSTRUMENT

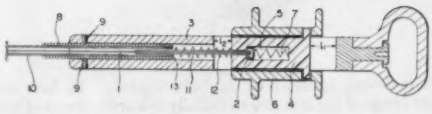
Nagashige Takahashi, Tokiwadai Green Haitsu 602, No. 28-10, Tokiwadai 3-chome, Itabashi-ku, Tokyo, Japan

Filed Aug. 9, 1977, Ser. No. 823,074

Claims priority, application Japan, Aug. 12, 1976, 51/107796

Int. Cl.[2] F16C *1/10;* A61B *5/00, 17/00;* F16B *7/10*

U.S. Cl. 74—501 R **4 Claims**



1. An apparatus for manipulating a medical instrument, such as a tissue sampling forceps, via a control wire slidably disposed within a flexible guide coil, comprising a flexible guide coil and a control wire slidably disposed within said guide coil, said apparatus further comprising:

(a) a hollow, elongated support tube,

(b) a plunger having an elongated cavity therein and being slidably disposed in the support tube,

(c) means coupled to the plunger for moving same within the support tube,

(d) a flexible expansion coil concentrically surrounding the guide coil within the support tube, one end of the expansion coil being secured to the support tube and the other end of the expansion coil being secured to the end of the guide coil,

(e) a stop member secured to the end of the control wire and slidably disposed within the cavity, and

(f) a spring disposed within the cavity for biasing the stop member against one end thereof, whereby the expansion coil yieldingly extends in response to excessive tension exerted on the control wire and the spring yieldingly compresses in response to excessive compression exerted on the control wire, thereby preventing breakage of or damage to the control wire and/or a medical instrument controlled thereby.

4,178,811

META REINFORCED PLASTIC DAMPER HUB

Michael Shepherd, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

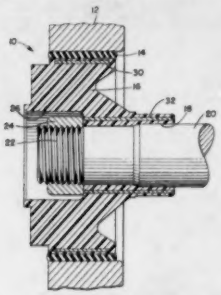
Filed Jun. 15, 1977, Ser. No. 806,709

Int. Cl.[2] F16F *15/00*

U.S. Cl. 74—574 **7 Claims**

1. A torsional vibration damper of the type having an outer inertia ring, a radially intermediate elastomer annulus, and a centrally apertured, radially innermost hub, the hub adapted to be secured to the end of a rotary crankshaft subject to torsional vibrations, the hub formed of plastic to thereby reduce its polar moment of inertia and thereby reduce the parasitic mass of the entire damper, the improvement comprising, a first rigid hoop, the first hoop embedded in the hub and positioned contiguous

to the outer peripheral surface of the hub, a second rigid hoop, the second hoop embedded in the hub and positioned contiguous to the surface of the central hub aperture which is adapted to receive the end of a crankshaft, the second hoop being of an axial extent substantially equal to the axial extent of the crank-



shaft receiving aperture of the hub, whereby the first hoop resists creep of the hub due to radially inwardly directed force of the said intermediate elastomer annulus and whereby the second hoop resists radial and clamping forces occasioned by attachment of the hub to a crankshaft.

4,178,812

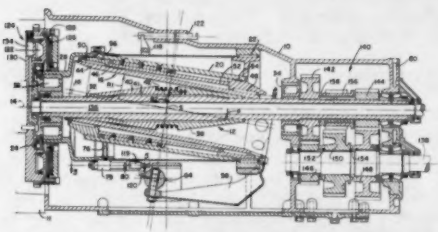
VARIABLE SPEED TRANSMISSION DEVICE

Yves J. Kemper, Birmingham, Mich., and Lucien Bigot, Nantes, France, assignors to Vadetec Corporation, Troy, Mich.

Division of Ser. No. 738,472, Nov. 3, 1976, Pat. No. 4,112,779. This application Apr. 21, 1978, Ser. No. 898,980

Int. Cl.[2] F16H *3/02*

U.S. Cl. 74—745 **3 Claims**



1. A torque transmission apparatus comprising:

a frame;

a first element including a first shaft supported by said frame for rotation on a first axis and supporting for rotation therewith a pair of axially movable cone-like members having oppositely converging exterior rolling surfaces of revolution defined by curved generatrices to be convex in axial section;

a second cylindrical element having an internal rolling surface concentric with a second axis intersecting said first axis at a point of axis intersection;

support means rotatable in said frame on said first axis to support said second element for nutating movement in which said second axis revolves in a conical path about said first axis so that the rolling surfaces of said first and second elements are in rolling frictional engagement at two points in a plane containing said first and second axes and located one on each side of said point of axes intersection;

eccentric means for adjusting the angle of intersection between first and second axes to shift said two points of rolling frictional engagement in opposite axial directions along said cone-like members thereby to vary the radii of the rolling surfaces on said first element at said two points of rolling frictional engagement;

means including an externally controlled pump carried by said support means for controlling the angular disposition of said eccentric means with respect to said cylindrical element and said support means to adjust the angle of intersection between said first and second axes;

clutch means having a driving member adapted to be connected with a source of driving torque and a driven member adapted to be keyed for rotation directly with said support means on one end thereof, and means for releasably engaging said driving and driven members;

a rotatable output shaft spaced from and parallel to said first shaft; and

a shiftable gear-type transmission for coupling said output shaft to said first shaft.

4,178,813

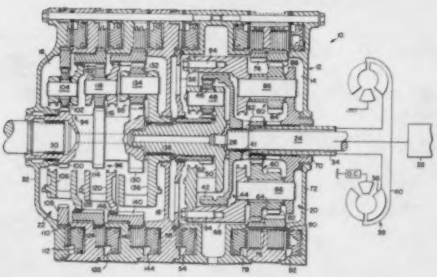
SPLIT INPUT PLANETARY TRANSMISSION

Alfred S. Smemo, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jan. 26, 1977, Ser. No. 762,587

Int. Cl.[2] F16H *57/10*

U.S. Cl. 74—764 **3 Claims**



1. A planetary transmission comprising: an input section, including a reversible planetary drive adapted for connection to a prime mover, an output section and an intermediate drive shaft coupled between said input and output sections; said output section including an output shaft coaxially aligned with and positioned adjacent to the intermediate drive shaft; low, intermediate and high speed planetary gear sets; each gear set including a sun and ring gear meshed with a plurality of planet gears; each sun gear being coupled for rotation with the output shaft; each gear set including a brake coupled to its ring gear and selectively operable for preventing rotation of the ring gear; and each gear set further including a planet carrier with the planet carrier of the low speed planetary gear set being coupled for rotation with the ring gear of the intermediate speed planetary gear set, with the planet carrier of the intermediate speed planetary gear set being coupled for rotation with the ring gear of the high speed planetary gear set and with the planet carrier of the high speed gear set being coupled for rotation with the intermediate shaft.

4,178,814

TWO-SPEED GEAR TRANSMISSION

Karl G. Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm,, Sweden

Continuation-in-part of Ser. No. 450,781, Mar. 13, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,261

Int. Cl.[2] F16H *57/10*

U.S. Cl. 74—781 R **35 Claims**

1. A transmission comprising:

a casing;

an input shaft and an output shaft,

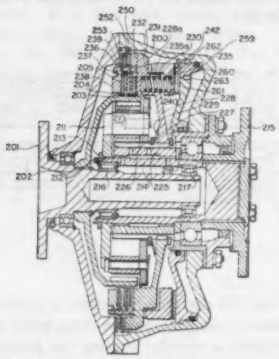
a planetary gear including a sun gear, a ring gear and at least

one planet gear between and operatively engaging the sun gear and the ring gear, said planet gear or gears mounted on a planet carrier, said planet carrier operatively engaged with one of said shafts, the ring gear operatively engaged with the other of said shafts,

a clutch arranged to operatively connect the gears of the planetary gear together for direct drive between the input and output shafts,

a brake arranged to hold stationary said sun gear, permitting a second gear drive between the two shafts at a drive ratio different from said direct drive,

rotating bearing means for mounting said shafts and said gears for receiving radial forces upon relative rotating motion,



a spring means for urging said clutch into engagement, and an actuating means mounted stationarily relative to the casing for offsetting the force of the spring means to disconnect the clutch and connect the brake, said spring means including a Belleville spring acting against two parts, both of which rotate together in the clutch engaged direct drive condition,

the gears of the planetary gear, the spring means and the actuating means being arranged such that upon engagement of the clutch means the force of the spring means bypasses all of said rotating bearing means which rotate during direct drive, and upon engagement of the brake, the force of the further actuating means bypasses all of said rotating bearing means which rotate during said second gear drive.

4,178,815

SEALED TORQUE TRANSMISSION ASSEMBLY

Cyril J. Astill, Deep River, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Dec. 2, 1977, Ser. No. 857,110
Claims priority, application Canada, Feb. 16, 1977, 271874
Int. Cl.[2] F16H *1/28*
U.S. Cl. 74—805 **2 Claims**

1. A sealed torque transmission assembly comprising:

(a) a casing with wall portions having a drive shaft opening and a driven shaft opening aligned therewith,

(b) a drive shaft having an eccentric portion and rotatably mounted in a fluidtight manner in the casing for rotation about a first axis and extending through the drive shaft opening with the eccentric portion within the casing, the eccentric portion extending along a second axis which is parallel with the first axis,

(c) an externally toothed driving gear mounted coaxially on the eccentric portion of the drive shaft for relative rotation therewith about the second axis,

(d) a flexible bellows enclosing the portion of the drive shaft within the casing and sealed in a fluidtight manner at one end to the casing and at the other end to the externally toothed driving gear,

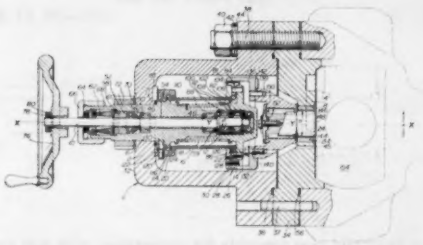
(e) an anti-rotation sleeve around the portion of the drive shaft within the casing,

(f) casing, universal coupling means coupling one end of the anti-rotation sleeve against relative rotation to the casing,

(g) driving gear, universal coupling means coupling the other end of the anti-rotation sleeve against relative rotation to the driving gear,

(h) a driven shaft rotatably mounted in the casing and extending through the driven shaft opening and into the casing, and

(i) an internally toothed driven gear, having a greater number of teeth than the driving gear, mounted on the driven shaft for rotation therewith, with the internal teeth thereof meshing with at least one external tooth to one side only of the driving gear, and wherein



(j) the axis of the eccentric portion of the drive shaft is parallel to and radially offset from the axis of rotation of the drive shaft by an amount 't', where:

$t = (PCDi - PCDe)2,$

and where:

PCDi = The pitch circle diameter of the teeth of the internally toothed driven gear, and

PCDe = The pitch circle diameter of the teeth of the externally toothed driving gear.

4,178,816

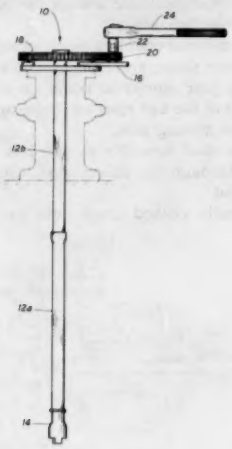
PORTABLE HYDRANT WRENCH

Robert Radice, 405 Oak Neck Rd., West Islip, Suffolk County, N.Y. 11795

Filed Jul. 31, 1978, Ser. No. 929,361
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.3 **3 Claims**

1. A portable hydrant wrench for assembly and use by a single workman to operate and replace valves located in underground portions of hydrants comprising one or more detachable drive bars having a rectangular cross-section, detachable heads for interchangeable mating with the different types of valves employed in the undergroundportion of hydrants, said heads being attached to the free end of said drive bars proximate to the valves in the underground portion of the hydrant, platform means secured to said hydrant to be serviced for positioning said drive bars within the center of said hydrant to be serviced, a gear assembly for connection to the free end of the combination of said drive bars opposite the free end having said detachable heads connected thereto, said gear

assembly being positioned upon said platform means, and a drive gear assembly positioned upon said platform means in



proximity to said gear assembly for cooperating with said gear assembly to rotate said hydrant wrench.

4,178,817

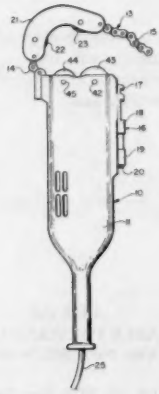
POWERED PIPE WRENCH

John Gibson, P.O. Box 2226, Gastonia, N.C. 28052

Continuation-in-part of Ser. No. 899,373, Apr. 24, 1978, abandoned. This application May 8, 1978, Ser. No. 903,722

Int. Cl.[2] B25B *17/00*

U.S. Cl. 81—57.13 **7 Claims**



1. A power pipe wrench comprising a housing, a drive motor mounted in said housing, only one driving roller rotatably mounted in said housing and protruding peripherally beyond one end of the housing, said driving roller having a toothed surface configuration, means driven by said motor for rotating said driving roller, a smooth surfaced idler roller rotatably mounted in said housing and extending peripherally beyond said one end of the housing, pipe retaining means carried by the housing, and means for positioning the said pipe retaining means about a pipe and attaching the pipe retaining means to opposite sides of the housing in operative relation to the driving roller and the idler roller, whereby said pipe is rotated from the toothed driving roller to the smooth surfaced idler roller and pressed against the smooth surfaced idler roller to smooth the surface of the pipe following its engagement by the driving roller.

4,178,818

METHOD OF CUTTING SOLIDS OF REVOLUTION BY A ROTARY TOOL HAVING CIRCULAR CUTTING LIP, AND A ROTARY TOOL FOR CARRYING SAME INTO EFFECT

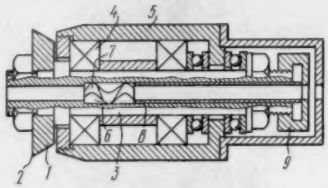
Petr I. Yascheritsyn; Alexandr V. Borisenko; Valery A. Sidorenko, and Evgeny A. Serebryakov, all of Minsk, U.S.S.R., assignors to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR, U.S.S.R.

Filed Apr. 17, 1978, Ser. No. 897,020

Claims priority, application U.S.S.R., Apr. 19, 1977, 2475943

Int. Cl.[2] B23B *29/00, 3/00;* **B26D** *1/12*

U.S. Cl. 82—36 R **1 Claim**



1. A rotary tool for carrying into effect a method of cutting solids of revolution, comprising: a working portion shaped as a solid of revolution; a circular cutting lip provided on said working portion; a spindle on which said working portion is set, said spindle having a centre through bore adapted for the stream of coolant to be fed therethrough; a screw-type wind turbine located in said through bore of said spindle and adapted to impart rotation to the tool when the stream of coolant is being fed through said bore.

4,178,819

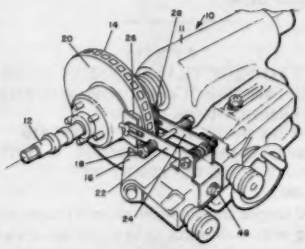
VIBRATION DAMPENING DEVICE FOR ROTATING DISK

Fred F. Mahon, 23 Willis Ave., Greenville, S.C. 29611

Filed Aug. 11, 1978, Ser. No. 932,774

Int. Cl.[2] B23B *25/00;* **B23Q** *11/00*

U.S. Cl. 82—38 A **3 Claims**



1. A device for reducing chattering in a rotating disk while opposed surfaces of said disk are being cut with cutting tools on a disk cutting machine, said device comprising:

a pair of laterally spaced elongated rigid arms,

pads carried on inner ends of said arms,

a bracket for mounting said device on said cutting machine adjacent said disk,

a pair of spaced flanges carried on said bracket,

a rod member extending between said flanges,

said outer ends of said rigid arms having holes provided

therein through which said rod member extends pivotally supporting said arms on said bracket,

a first resilient member carried on said rod between said outer ends of said rigid arms resiliently biasing said outer ends of said arms against said flanges,

second resilient biasing means engaging said arms forcing said pads in engagement with said opposed surfaces of said disk minimizing vibrations, and

means for adjusting said second resilient biasing means for varying the pressure exerted by said pads on said opposed surfaces of said disk.

4,178,820

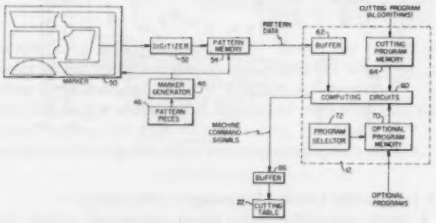
METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL WITH IMPROVED ACCURACY

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology,, South Windsor, Conn.

Division of Ser. No. 790,035, Apr. 22, 1977, Pat. No. 4,133,234. This application May 18, 1978, Ser. No. 907,330

Int. Cl.[2] B26D *5/00*; B26F *1/38*

U.S. Cl. 83—13 **39 Claims**



1. A method of cutting sheet material with an automatically controlled cutting machine having a cutting tool advanced along a cutting path during relative movements of the sheet material and cutting tool and in accordance with predetermined information defining the cutting path comprising:

reducing the predetermined information to a machine readable form;

establishing a primary program for processing the reduced predetermined information and generating fundamental commands for advancing the sheet material and the cutting tool relative to one another along the cutting path in accordance with the predetermined information;

establishing an optional program for processing the reduced predetermined information in conjunction with the primary program and generating supplemental machine commands;

storing the primary and optional programs in a program memory;

activating the primary program stored in the memory;

selectively activating or not activating the optional program stored in the memory by means of a selector on the cutting machine;

processing the predetermined information with the primary program and generating fundamental machine commands when the optional program has not been selected at the cutting machine;

processing the predetermined information with the primary and the optional program and generating supplemental and fundamental machine commands when the optional program has been selected at the cutting machine; and

controlling the relative movement of the sheet material and the cutting tool with the machine commands generated.

9. An automatically controlled cutting machine for cutting sheet material comprising: a cutting table including a cutting tool and a support surface on which sheet material is held during a cutting operation; motive means responsive to machine command signals for moving the sheet material and cutting tool relative to one another in cutting engagement; computing means receiving data defining desired cutting paths in the sheet material for generating machine command signals which produce the desired cutting paths from the received data, said computing means also including an optional program memory having a program of biassing signals for combination with the machine command signals; and means for selecting the optional program.

4,178,821

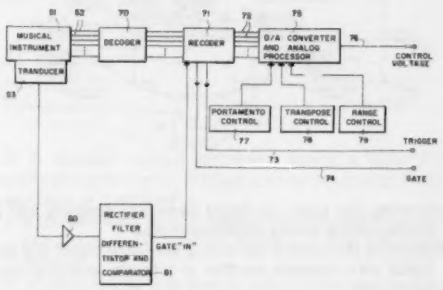
CONTROL SYSTEM FOR AN ELECTRONIC MUSIC SYNTHESIZER

Salvatore Gallina, and Stan Davidson, both of New York, N.Y., assignors to M. Morell Packaging Co., Inc., New York, N.Y.

Filed Jul. 14, 1976, Ser. No. 705,120

Int. Cl.[2] G10H *1/02, 5/00*

U.S. Cl. 84—1.01 **11 Claims**



1. In a system for synthesizing music including a plurality of selected operable switch means, a synthesizer at least responsive to analog input voltages for synthesizing tones of a frequency related to the amplitude of said analog input voltages, and control means responsive to operation of said switch means for producing said analog input voltages; the improvements wherein said control means comprises means responsive to the operation of said switch means for producing a binary coded signal proportional to a tone to be reproduced, said means for producing a binary coded signal being a decoder connected to said switch means and having a plurality of output lines each corresponding to a separate tone and recoder means responsive to the energization of said output lines for producing said binary coded signal, digital-to-analog converter means connected to convert said binary coded signal to an analog output signal, means applying said analog output signal to said synthesizer and said recoder means having means for scanning said output lines to provide a binary coded output signal corresponding to an output line having a signal thereon, said means for scanning including multiplexer means, a counter, clock means for continually stepping in said counter, the output of said counter being applied to said multiplexer for continually addressing said multiplexer to scan said output lines, and a means responsive to a coincidence between the address of said counter and an output line having a signal for recessing said counter, whereby the output count of said counter is a binary coded signal proportional to the tone to be synthesized.

4,178,822

MUSICAL SYNTHESIS ENVELOPE CONTROL TECHNIQUES

Sydney A. Alonso, Strafford, Vt. 05072

Filed Jun. 7, 1977, Ser. No. 804,361

Int. Cl.[2] G10H *1/00, 3/00*

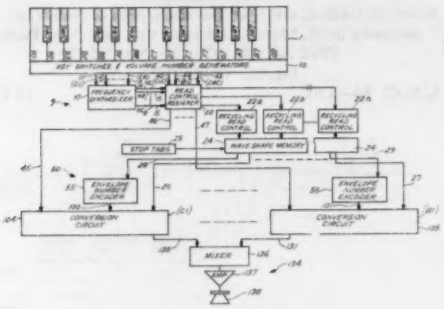
U.S. Cl. 84—1.01 **12 Claims**

1. A method of synthesizing an audible note comprising the steps of:

generating a time-spaced series of digital amplitude numbers representing the average amplitude of the note at discrete

instants in time, said step of generating a time-spaced series of digital amplitude numbers comprising the separate steps of generating a time-spaced series of digital volume numbers representing the average volume component of the note amplitude and generating a time-spaced series of digital envelope numbers representing the attack or decay envelope component of the note amplitude;

generating a time-spaced series of digital wave numbers representing the waveshape and fundamental frequency characteristics of the note at discrete instants in time;



converting the series of digital amplitude numbers into a corresponding analog amplitude signal;

multiplying the value of the analog amplitude signal and the digital wave numbers together to generate an analog tone signal; and

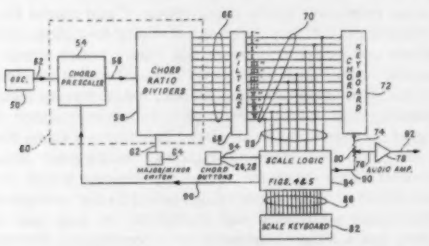
converting the analog tone signal into the audible note, whereby the composite and complex characteristics of the note can be rapidly generated in real time.

4,178,823

PORTABLE ELECTRONIC MUSICAL INSTRUMENT

J. Marion McCoskey, and R. Britton Webb, both of Box 225, Round Mountain, Calif. 96084

Filed Sep. 7, 1978, Ser. No. 940,252
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **23 Claims**



1. A portable electronic musical instrument, which comprises:

(a) a keyboard including a plurality of scale keys and a plurality of chord keys,

(b) a programmable frequency divider network capable of producing different output frequencies depending on which keys of said keyboard are activated,

(c) decoding means connected between said keyboard and said programmable frequency divider network for supplying signals to cause said programmable frequency divider network to produce different output frequencies depending on which keys of said keyboard are activated, and

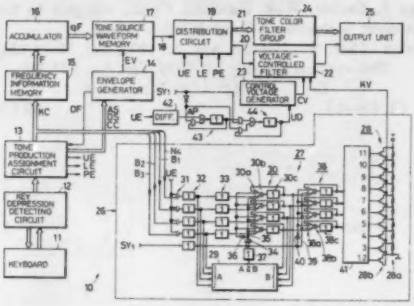
(d) means connected between said scale keys and said programmable frequency divider network for altering the output frequencies for generating chords produced by said programmable frequency divider network, the alteration being based on scale key closures so that chords produced from the output frequencies are compatible with scale notes corresponding to the scale key closures.

4,178,824

ELECTRONIC MUSICAL INSTRUMENT

Eiichiro Aoki, and Shigeru Yamada, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 21, 1977, Ser. No. 862,780
Claims priority, application Japan, Dec. 23, 1976, 51/155507
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.19 **7 Claims**



1. A polyphonic musical instrument comprising:

(a) a single controlled type signal processing means for forming musical tones, to which plural time division multiplexed tone source signals corresponding to plural tones are applied, the tones produceable by said instrument being divided into ranges,

(b) means for generating tone identifying signals respectively identifying the range containing each of said plural tones;

(c) means for preferentially selecting one of said generated tone identifying signals; and

(d) means for producing a control signal in accordance with the tone identifying signal thus selected, said control signal being applied to said controlled type signal processing means so as to control a characteristic thereof.

4,178,825

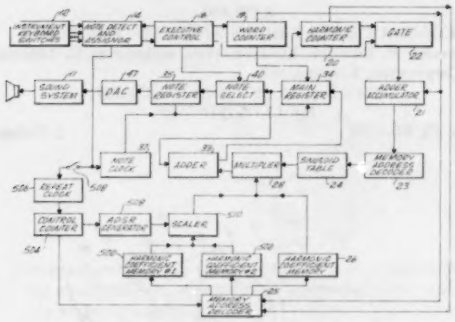
MUSICAL TONE SYNTHESIZER FOR GENERATING A MARIMBA EFFECT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Jun. 6, 1977, Ser. No. 803,446
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **6 Claims**

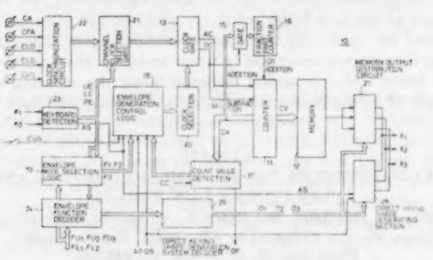
1. In a keyboard operated digital tone generator in which a musical tone is produced by repeatedly calculating a master data set representing the relative amplitudes of a series of points on the waveform of the tone to be generated and converting the data set to an analog voltage input applied to a sound system, the data set being calculated when a key is depressed by multiplying in multiplier means a set of stored harmonic coefficients one coefficient at a time with a stored table of sinusoid values and summing the product values from one coefficient value with the product values from each of the other coefficient values to provide said data set, apparatus for producing a marimba effect comprising: means storing first and second sets of harmonic coefficients, means including a clock source for reading out coefficient values from the first set of harmonic coefficients in sequence during one clock interval of the clock source and coefficient values from the second set of

harmonic coefficients in sequence, the sets being read out alternately during successive time intervals of the clock source, variable scaler means, means changing the scale factor of the variable scaler means in the same predetermined manner during each of said successive time intervals of the clock source, the harmonic coefficient values read out of said storing



means being applied to said scaler means, the output of the scaler means being coupled to said multiplier means for calculating a master data set which changes in time with changes in the scale factor of the scaler means and with alternate reading out of the two sets of coefficient values, the coefficients in said second set having the odd numbered coefficients equal to zero.

4,178,826
ENVELOPE GENERATOR
Teruo Hiyoshi; Akira Nakada; Tsutomu Suzuki; Eiichiro Aoki, and Eiichi Yamaga, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Oct. 6, 1977, Ser. No. 839,912
Claims priority, application Japan, Oct. 8, 1976, 51/120936
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.26 **9 Claims**



1. An envelope generator for an electronic musical instrument, said generator providing selectably different musical envelope shapes, comprising:

a counting circuit selectively operable in a linear counting mode and in a non-linear counting mode, each in response to count pulses applied thereto;

a count mode control means for switching said counting circuit to one of said linear or non-linear counting modes;

a plurality of clock pulse sources, each supplying count pulses at different rates;

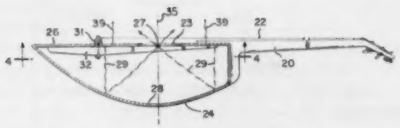
a count rate control means for applying to said counting circuit count pulses from a selected one of said sources;

an envelope shape selection means for programmatically causing (a) said count mode control means to select said counting modes and (b) said count rate control means to apply count pulses from different sources so that the resultant count values of said counting circuit will correspond to a selectable envelope shape; and

a conversion circuit for converting said resultant count values of said counting circuit to amplitude data;

said envelope generator thereby generating an envelope shape having an amplitude variation corresponding to the resultant variation in said count value.

4,178,827
STRINGED INSTRUMENT CONSTRUCTION
William K. Mallory, 2115 S. 128th St., Seattle, Wash. 98168
Filed Apr. 19, 1978, Ser. No. 897,797
Int. Cl.[2] G10D *1/08*
U.S. Cl. 84—291 **4 Claims**



1. A stringed musical instrument having a body with a soundboard assembly for producing an optimum sound volume comprising in combination:

a. a soundboward having a planar interior underside surface and an exterior top surface and a sound hole passing therethrough;

b. a string bridge attached to said exterior surface of said soundboard;

c. a first and a second longitudinal main brace attached to said interior underside surface, each opposite of said sound hole and each disposed from said soundboard substantial upper to said soundboard substantial lower end, thereby each having a portion intersecting with said string bridge location being opposite at said exterior side of said soundboard;

d. a first and a second compressioned transmission joint having each a compression mechanical fastener, each said joint formed by

(1) said bridge,

(2) said soundboard inbetween said bridge and said portion of each said main braces intersecting with said bridge,

(3) said portion of each said main braces intersecting with said bridge,

(4) said compression mechanical fastener for connecting said bridge, soundboard and each said respective main braces in a predetermined constant compression;

e. a plurality of side braces fastened to said soundboard interior underside surface and to each said first and to each said second compressioned transmission joint at each said portion of each said main braces intersecting with said bridge at said soundboard interior underside and emanating in fan-shaped fashion from each said joint;

f. a plurality of parallel braces, parallel to one another at predetermined positions, each interconnecting said first and said second main braces at opposite sides of said sound hole; and

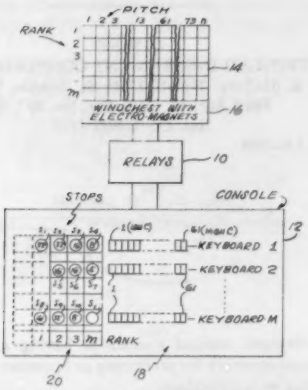
g. a backside having a parabolic interior shape rigidly connected at its periphery to said soundboard, whereby said parabolic interior shape is shaped and located in predetermined relationship to said sound hole location so that an imaginary focal point is obtained substantially at said sound hole center, said backside adapted to effect immediate transmission of associated sound wave vibrations from said soundboard interior underside surface towards said parabolic shape and for direct reflection therefrom through said sound hole focal point.

4,178,828

COMPUTERIZED UNIT ORGAN RELAY

Lawrence J. Henschen, 780 S. Warrington Rd., Des Plaines, Ill. 60016

Filed Jul. 29, 1977, Ser. No. 820,149
Int. Cl.[2] G10B *3/10*
U.S. Cl. 84—337 **20 Claims**



1. In a unit pipe organ which includes a plurality of air-actuated pipes arranged in a plurality of ranks and a console for designating which of said plurality of pipes are to be played, said console including a plurality of keyboards each having a plurality of keys, and a plurality of stops associated with each keyboard, wherein a given rank of said pipes may be enabled by different stops on different keyboards, the improvement which comprises:

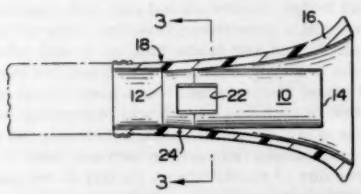
a unit organ relay means comprising a programmable data processor connected between said console and said plurality of pipes operating under the control of a program for calculating which of said pipes should be actuated in response to the key-stop combinations designated on said console.

4,178,829

POWER TUBE FOR FLARED BELL MUSICAL INSTRUMENTS

John W. Wolford, P.O. Box 1024, Dundee, Fla. 33838

Filed May 24, 1978, Ser. No. 909,057
Int. Cl.[2] G10D *9/00*
U.S. Cl. 84—386 **7 Claims**



1. A power tube for attachment within the bell of a flared bell musical instrument, said power tube comprising a hollow tubular member of a substantially constant inner diameter and open at both ends, said tubular member having first and second parallel oriented circular end surfaces aligned perpendicular to the longitudinal axis of said tube, the outer surface of the first end surface forming an airtight seal with the interior surface of the bell at a point just prior to the point were the bell commences its rapid outward sweep, said tube having a length such that the second end surface is positioned within the interior of said bell and an interior wall aligned at a constant angle with respect to the longitudinal axis of said tube, said tube including a pair of diametrically opposed vents positioned in close proximity to the first end surface which provide fluid communication between the exterior wall of said tube and the interior surface of said bell to permit a flow of air from said space into the interior volume of said tube.

4,178,830

COMPACT B-FLAT HORN AND CASE THEREFOR

Lawrence V. Ramirez, Kenosha, Wis., assignor to G. Leblanc Corporation, Kenosha, Wis.

Filed Sep. 14, 1977, Ser. No. 833,004
Int. Cl.[2] G10D *7/10*
U.S. Cl. 84—388 **3 Claims**

1. A brass horn comprising convoluted lengths of tubing in laterally close-coupled disposition and having an entering end length of tubing for mouthpiece attachment at one end thereof and an exit end including a tubing loop traversing the tubing convolutions within the maximum extent thereof and merging with a flare having the center axis thereof parallel to and above the longitudinal axis of the entering end length of tubing, a bell with a detachable connection to the end of the flare at a location where the center axis of the bell is coincident with the center axis of the flare and parallel to the longitudinal axis of the entering end length of tubing to open oppositely to an attached mouthpiece giving the player clear vision below the bell to see sheet music or the frontal area if marching, the axial extent of the bell being relatively short to not substantially exceed the transverse extent of the close-coupled tubing and flare for compact case packing when detached, and touch keys for piston valve actuation disposed along the entering end length of tubing below the adjacent tubing loop and flare.

4,178,831

FLUID PRESSURE DEVICE FOR SUPPORTING AND ELEVATING A GUN BARREL

Gustav H. Tidemalm, and Björn E. Vidinghoff, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Jun. 27, 1977, Ser. No. 810,465
Claims priority, application Sweden, Jul. 5, 1976, 7607651
Int. Cl.[2] F41F *21/08*
U.S. Cl. 89—41 H **18 Claims**

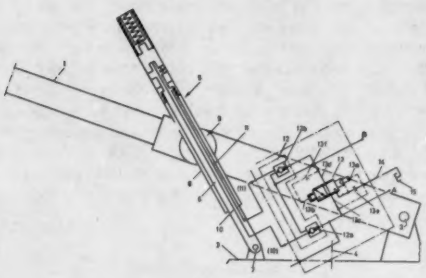
1. Apparatus for supporting and elevating the barrel of an artillery weapon and the like, said apparatus comprising:

first and second telescoping cylinder members, one of said cylinder members pivotally attached to a frame portion of said weapon and said remaining cylinder member rotatably attached to said barrel;

a first piston member fixed within said telescoping cylinder members and a second piston member selectively movable within said telescoping cylinder members toward and away from said fixed piston member for supporting said barrel while dampening any sudden movement of said barrel;

passage means extending through said telescoping members into contact with said piston assembly means for selec-

tively providing a first, positive pressure against a first side of said piston assembly means and for providing a second, positive pressure against a second side of said piston assembly means; and



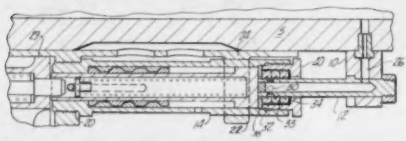
pressure distributing valve means joining said passage means for controlling the pressure ratio across said piston assembly means to support and elevate said barrel as required.

4,178,832

AUTOMATIC GUN HAVING GAS LEAKAGE CONTROL MECHANISM

Robert B. Crowell, Newport Beach, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 25, 1978, Ser. No. 909,741
Int. Cl.[2] F41D *1/06*
U.S. Cl. 89—159 **3 Claims**



1. In a recoil-operated automatic gun comprising a receiver, a barrel mounted for reciprocal axial movement in the forward portion of the receiver, a bolt carrier slidably disposed within the receiver, and means for operating the bolt carrier; said bolt-operating means comprising a gas cylinder projectly forwardly from the receiver, a piston slidably disposed within the cylinder, a yoke depending from the barrel forwardly of the receiver and a gas tube extending rearwardly from the yoke into the gas cylinder; said piston having its forward end normally engaged with the gas tube and its rearward end engaged with the bolt carrier, whereby the action of firing a round causes hot combustion gases to be introduced from the barrel into the gas tube through the afore-mentioned yoke, after which the barrel recoils to produce both mechanical and gas pressure forces on the forward end of the piston:

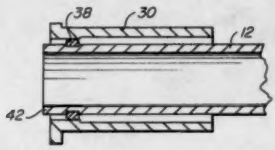
the improvement comprising a series of leakage control rings floatably positioned within the gas cylinder in surrounding relationship to the gas tube, each control ring having an internal diameter that is only slightly larger than the external diameter of the tube by a specified amount; each leakage control ring being capable of independent adjustment in any radial direction whereby the individual rings are precluded from binding frictional contact with the tube even though the tube and barrel may not move precisely parallel to one another.

4,178,833

SNAP RING BEARING FOR A GUN BARREL BUSHING

Fred R. Miller, 2620 E. 32nd St., Davenport, Iowa 52807

Filed Oct. 18, 1976, Ser. No. 733,658
Int. Cl.[2] F41C *5/06*
U.S. Cl. 89—163 **5 Claims**



1. In combination:

a pistol frame,

a slide slidably mounted on said frame between a forward battery position and a rearward recoil position,

a barrel bushing on the forward portion of said slide,

a barrel having its forward muzzle end slidably and pivotally positioned in said barrel bushing, and

a bearing on said barrel engageable with said bushing when said slide is in said forward battery position,

said barrel having a groove near the muzzle end thereof with said bearing positioned therein,

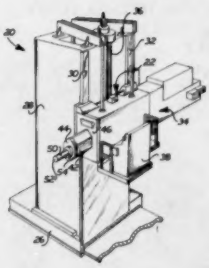
said bearing consisting of a split ring having a rounded outer shoulder.

4,178,834

MACHINE TOOL HAVING DEFLECTION COMPENSATION FOR TOOL SUPPORT ARM

Paul E. Holmstrom, Cincinnati, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,170
Int. Cl.[2] B23Q *11/00*
U.S. Cl. 409—80 C **50 Claims**

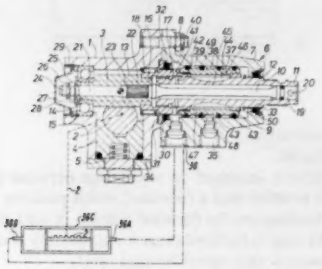


19. A method of operating a machine tool having an upwardly extending track along which a carriage for an extendible tool support arm is movable, said method comprising the steps of moving the carriage along the track to raise and lower the tool support arm, extending the tool support arm, allowing the tool support arm to deflect when it is extended, and compensating for deflection of the tool support arm by changing the angular orientation of the carriage relative to the track to change the position of an inner end portion of the tool support arm relative to the position of an outer end portion of the tool support arm.

4,178,835
ROTARY VALVE FOR POWER-ASSISTED STEERING MECHANISM

Barry J. Millard, Reading, England, assignor to Adwest Engineering Limited, Great Britain

Filed Jan. 30, 1978, Ser. No. 873,679
Claims priority, application United Kingdom, Feb. 16, 1977, 6382/77
Int. Cl.² F15B 9/10
U.S. Cl. 91—375 A 11 Claims

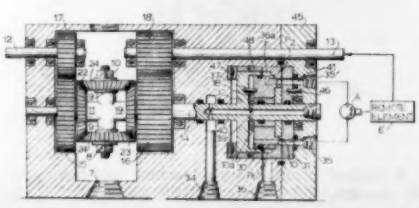


1. A rotary valve for a power-assisted rack-and-pinion steering mechanism for a motor vehicle, the rotary valve comprising a valve sleeve, a rotor member rotatable within the valve sleeve, the rotor member having an input connection whereby it is connectible with the steering control of a vehicle so that rotary motion will be imparted thereto when the steering control is operated, the rotor member and the valve sleeve each having axially extending grooves therein which cooperate to control the flow of fluid under pressure through the valve according to the angular disposition of the rotor member relative to the valve sleeve, a cylindrical pinion, an annular coupling member rigidly connecting the pinion to the valve sleeve, one end portion of said annular coupling member being fitted over an end portion of the pinion and having internal teeth which intermesh with the teeth of the pinion, the annular coupling member being bonded to the pinion and to the valve sleeve, and an elongated torsion bar having one end connected to the rotor member and the remaining end connected to the pinion.

4,178,836
MECHANICAL HYDRO SERVO VALVE

Hubert Maisonneuve, West Columbia, S.C., assignor to Canron Inc., New York, N.Y.

Filed Feb. 8, 1977, Ser. No. 766,672
Int. Cl.² F15B 9/12
U.S. Cl. 91—381 8 Claims

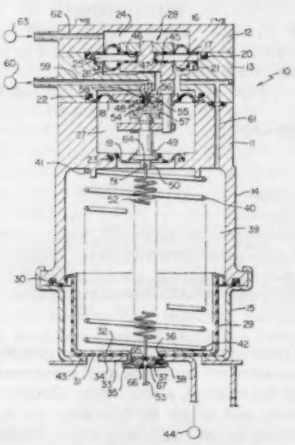


1. A condition responsive servo control valve for controlling a variable condition of an actuator means for controlling a remote element, the valve comprising a first input shaft rotatable according to a desired input condition and a second input shaft rotatable according to the condition of the remote element, an output shaft, a differential gear train interconnecting said first and second input shafts to said output shaft, and a rotary fluid valve operably connected to said output shaft to provide a fluid output representing the difference between the conditions determining the first and second input shaft positions, said rotary fluid valve having a valve inlet means and a valve outlet means, a rotary valve plate drivably connected to said output shaft and a stationary valve plate with which said rotary valve plate is in mating relationship, said rotary and stationary valve plates each having fluid flow ports therein respectively connected to the valve inlet means and the valve outlet means and arranged in a cooperative relationship to control fluid flow from the valve inlet means and direct it to the valve outlet means with the flow being according to the relative angular positions of said rotary and stationary valve plates, whereby said output can be applied to the actuator means operable to bring the condition of the remote element other than the desired input condition and the desired input condition into conformity.

4,178,837
PNEUMATICALLY OPERATED ACTUATOR AND METHOD OF MAKING THE SAME

Alfred A. Frankenberg, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 27, 1977, Ser. No. 864,374
Int. Cl.² F15B 13/16
U.S. Cl. 91—387 8 Claims

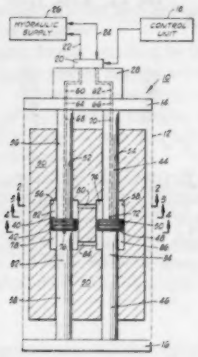


1. In a method of making a pneumatically operated actuator having a housing means provided with a pneumatically operated movable wall interconnected by a feedback tension spring to a pilot valve positioner that is adapted to pneumatically move said movable wall of said actuator in relation to a pneumatic signal directed to said positioner and in opposition to a biasing means of said wall, the improvement comprising the steps of loosely projecting one end of said spring through an opening in said wall after the other end of said spring has been interconnected to said pilot valve positioner, directing a predetermined pneumatic signal to said positioner, pulling on said one end of said spring until said wall moves relative to said one end of said spring in opposition to said biasing means and assumes a position thereof relative to said one end of said spring and said housing means that corresponds to said predetermined pneumatic signal, and securing said one end of said spring to said wall while said wall is in said position thereof and said spring is in the pulled condition thereof that caused said wall to move to said position thereof.

4,178,838
OIL PORTING SYSTEM FOR DUAL CYLINDER VIBRATOR

Jay H. Stafford, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Nov. 3, 1977, Ser. No. 848,226
Int. Cl.² F01B *15/02*; F15B *11/16*
U.S. Cl. 92—117 A **7 Claims**



1. A method of porting hydraulic fluid to a seismic vibrator of the type having a frame, reaction mass including plural internal cylinders, and plural respective double rod end pistons secured to said frame and disposed for controlled relative reciprocation within a respective internal cylinder, comprising:

communicating by cross-porting each of said internal cylinders on one side of said pistons;

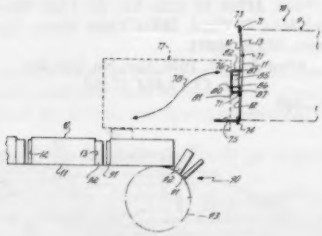
communicating by cross-porting each of said internal cylinders on the opposite side of said pistons; and

providing hydraulic fluid communication through a selected different piston rod end to each of the one and opposite sides of said internal cylinders to enable reciprocal drive of said reaction mass.

4,178,839
CARTON ERECTING APPARATUS

Charles C. Hughes, Ludlow, Ky., assignor to R. A. Jones & Co. Inc., Covington, Ky.

Continuation-in-part of Ser. No. 723,992, Sep. 16, 1976, Pat. No. 4,057,008. This application Sep. 19, 1977, Ser. No. 834,166
Int. Cl.² B31B *5/00*
U.S. Cl. 93—53 SD **8 Claims**



1. In apparatus for erecting tubular carton blanks which are flat folded and have a first surface on one side and a second surface on the other side, a mechanism for partially opening said flat folded blank comprising,

at least one suction cup,

a support on each side of said suction cup,

means for positioning said cup and supports against the second surface of a flat folded carton blank with said supports in engagement with said surface of said blank inboard of the edges of said blank,

said supports having carton engaging surfaces lying in a plane,

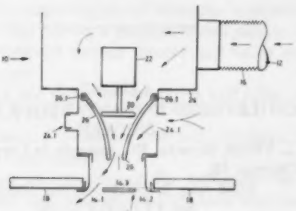
said cup having a lip normally located approximately in said plane and engageable with a carton blank surface and movable away from the plane of said supports upon application of vacuum to said cup to pull said second surface past the plane of said supports and thereby bow the surface of the blank engaged by said cup to partially open said blank,

and means for applying vacuum to said cup.

4,178,840
AIR DISCHARGE TERMINAL UNIT

Nicholas Caknis, c/o P.O. Box 4035, Pretoria 0001, South Africa

Filed Mar. 10, 1978, Ser. No. 885,113
Claims priority, application South Africa, Mar. 11, 1977, 77/1500
Int. Cl.² F24F *13/06*
U.S. Cl. 98—38 E **2 Claims**



1. An air discharge terminal unit comprising a plenum having a main air inlet, an induced air inlet, a first air outlet and a second air outlet, spaced from the first air outlet in a direction away from the induced air inlet, the induced air inlet being located unilaterally along the flow path of a main air stream which flows between the main air inlet and the air outlets, a pair of modulating control vanes located along the flow path of the main air stream on opposite sides thereof, one of said vanes being disposed between said flow path and said induced air inlet, and means for simultaneously moving said vanes toward and away from each other thereby respectively to restrict said main air inlet and expand said main air inlet and respectively to move said one vane away from and toward said induced air opening thereby respectively to expose and to mask said induced air opening.

4,178,841
AIR VENT

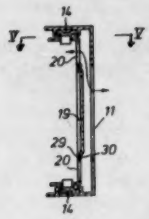
Gerhard Frank, Wilnsdorf-Obersdorf, and Eckhard Kucharczyk, Netphen, both of Fed. Rep. of Germany, assignors to Siegenia-Frank AG., Siegen, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,317
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2703207
Int. Cl.² F24F *13/18, 7/00*
U.S. Cl. 98—98 **11 Claims**

1. Air vent consisting of a fixed, gridlike apertured front panel and of a stop plate disposed behind it, which is movable by a control mechanism transversely of its plane and to the plane of the front panel, which stop plate in a position resting against the back of the front panel closes the grid apertures, but which in a position raised therefrom opens the grid apertures of the front panel for the passage of air,

characterized by the fact that the control mechanism has at least one thrust rod (**24, 54**) that is adjustable parallel to the longitudinal edges of the front panel (**9, 39**) and that is

linearly movable in guides (13, 14, 43, 44) thereof, beside which lies a flange (21, 51) extending over the entire length of the stop plates (15, 45) and essentially oriented transversely of their plane, and that adjusting elements are provided distributed along the length of the thrust rod (24,



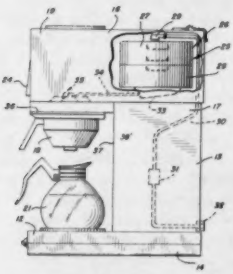
54) and of the flange (21, 51), the adjusting elements consisting of studs (25, 55) engaging oblique slide slots (22, 52), and that holders (26, 27) are provided at the front panel (9, 39) holders, so that the stop plate (15, 45) is fixed in such a way that it is movable only in an transverse direction.

4,178,842

CANTILEVERED INSTANTANEOUS HEATING BREWER

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed Aug. 2, 1978, Ser. No. 930,813
Int. Cl.[2] A47J *31/10*
U.S. Cl. 99—281 **9 Claims**



1. In a beverage brewer having a base defining a rear portion, an upright upstanding from said base rear portion, and a head having a rear portion mounted to the top of said upright and cantilevered forwardly from the upper end of the upright to overlie the base, said head further defining a front portion, and means on said front porin of the head for removably supporting a brewing cartridge thereunder, an improved structural arrangement for delivering hot brewing water to the cartridge comprising:

massive heat transfer means mounted in said head at said rear portion thereof fully above said brewing cartridge and defining an effectively instantaneous heat transfer device;

means for delivering cold water to said heat transfer means to be heated by heat transfer association therewith to a preselected hot brewing temperature; and

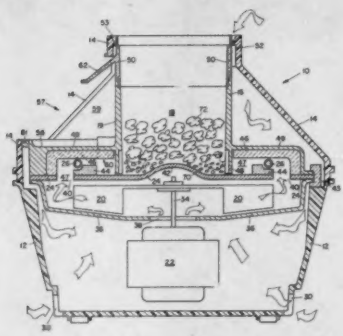
conduit means extending forwardly from said heat transfer means to the cartridge for delivering the hot brewing water from said heat transfer means into the cartridge for brewing a beverage in the cartridge.

4,178,843

PORTABLE CORN POPPER

Steven B. Crabtree, Chillicothe; Hugh F. Groth; Guilbert M. Hunt, both of Brecksville; Thomas E. Lipinski, Bath; James T. McMaster; Guy R. Moffitt, Jr., both of Chillicothe; Anthony D. Szpak, Parma, and Robert A. Williams, Chillicothe, all of Ohio, assignors to Wear-Ever Aluminum, Inc., Chillicothe, Ohio

Filed Feb. 6, 1978, Ser. No. 875,339
Int. Cl.[2] A23L *1/18*
U.S. Cl. 99—323.8 **5 Claims**



1. An apparatus for popping corn by heated air comprising:

a housing;

means for heating air;

a cylindrical popping chamber within said housing having its axis vertical, said chamber being open at the top and having its diameter larger at its upper portion than at its lower portion;

means for flowing air in a generally circular path about the outside periphery of said chamber to facilitate heating of the air; and

means for introducing heated air into the lower portion of said chamber to flow the air within the chamber into a generally circular path about said axis to provide a fluidized bed of corn to be popped moving in a generally circular path within said chamber;

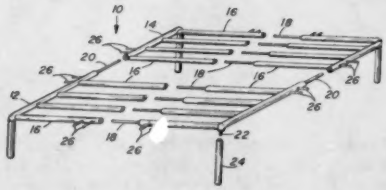
the air controlled to retain popped corn within said chamber to form a column of popped corn rising upwardly above said popping chamber and to be discharged out the open top of said chamber in a controlled manner.

4,178,844

TWO-WAY ADJUSTABLE COOKING GRID

Frances S. Ward, 21906 10 Mile Rd., St. Clair Shores, Mich. 48080, and John J. Ward, 28971 Little Mack, Apt. B-1, St. Clair Shores, Mich. 48081

Filed Jul. 27, 1978, Ser. No. 928,404
Int. Cl.[2] A47J *37/07*
U.S. Cl. 99—449 **5 Claims**



1. A first two-way adjustable cooking grid comprising:

a first set of parallel, spaced apart tubes perpendicularly attached to a first end tube;

a second set of parallel spaced tubes perpendicularly attached to a second end tube, said first and second sets spaced apart from but parallel to each other, said second end tube having a first rod fixedly attached to its center and projecting therefrom to slidingly engage the open end of said first end tube;

a third set and a fourth set of parallel, spaced apart tubes perpendicularly attached to a third and a fourth end tube, respectively, said third and fourth sets of tubes spaced opposite and coaxial with said first and said second sets of parallel, spaced apart tubes;

a multiplicity of rods fixedly attached to the open ends of said third and fourth sets of parallel tubes, said rods extending from the open ends of said third and fourth sets of parallel tubes a distance, said multiplicity of rods slidingly engaging the open ends of said first and second sets of parallel, spaced apart tubes;

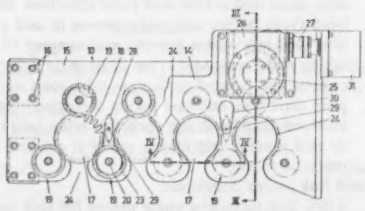
a second rod extending from the center of said fourth end tube toward said third end tube and fixedly attached to said fourth end tube, said second rod extending therefrom a distance, said second rod slidingly engaging the open end of said third end tube; when the various rods engage their adjacent tubes, a two-way adjustable grid is formed.

4,178,845

TWISTING AND CUTTING DEVICE FOR BINDING AT LEAST ONE THREAD PUT AROUND A PRESSED BALE

Jean-Claude De Gryse, Dadizele, Belgium, assignor to Naamloze Vennootschap Declametaal, Dadizele, Belgium

Filed Mar. 17, 1978, Ser. No. 887,804
Claims priority, application Belgium, Mar. 23, 1977, 852797
Int. Cl.[2] B65B *13/28*
U.S. Cl. 100—11 **8 Claims**



1. A twisting device for two parts of thread running from different feed spools and made to be adjacent to each other at the location of the device, said device comprising:

a frame,

three gear-wheels rotatably mounted in relation to the frame,

a twisting member consisting of a fourth gear-wheel mounted in relation to the frame in the space enclosed by said three gear-wheels and being in

direct mesh with each of said three gear-wheels, and

driving means for one of said three gear-wheels,

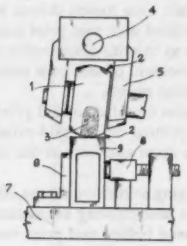
said twisting member having teeth and valleys between the teeth, at least some of these valleys being deep enough to receive simultaneously a tooth of one of said three gear-wheels and the thread, said frame being provided with a cut out aperture in front of the twisting member permitting the thread to enter into one of said deep enough valleys.

4,178,846

APPARATUS FOR, AND A PROCESS OF, SECTOR ENGRAVING METAL ELEMENTS

Cesare Giovanelli, Gardone Val Trompia, Italy, assignor to Bottega Incisioni di Orizio-Giovanelli, Gardone Val Trompia, Italy

Filed Jun. 30, 1977, Ser. No. 811,868
Claims priority, application Italy, Apr. 21, 1977, 22724 A/77
Int. Cl.[2] B41F *17/00*
U.S. Cl. 101—5 **15 Claims**



1. Apparatus for engraving metal elements, comprising:

an engraving roller having a predetermined pattern formed upon the peripheral surface thereof and being rotatable about a first axis;

means mounting said roller for permitting said roller to pivot about a second axis;

a workpiece disposed in contact with said peripheral surface of said engraving roller; and

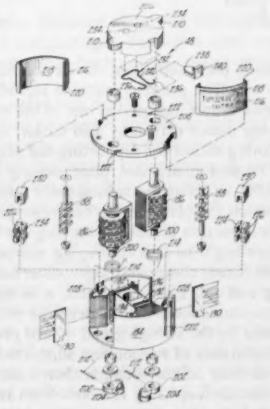
means mounting said workpiece for movement in planes parallel to said first and second axes such that fractional portions of said predetermined pattern are sequentially reproduced upon said workpiece.

4,178,847

ITEM ENDORSING APPARATUS

Heinrich S. Erhardt, Warminster, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 14, 1977, Ser. No. 833,298
Int. Cl.[2] B41L *47/46*
U.S. Cl. 101—91 **10 Claims**



1. High speed item printing/endorsing apparatus of modular construction usable for example with item sorting apparatus for endorsing or printing on checks and the like and being demountably removable and replaceable at will comprising:

an input shaft driven at a single speed,

an output shaft,

drive means for rotating said input shaft and said output shaft,

differential gear train shaft speed determining means interconnecting said input shaft with said output shaft settable into one of two states to set a desired one of two speeds of the output shaft to select the printing speed,

means coupled to said shaft speed determining means effective when energized to change the output speed of the output shaft to the selected state, print means coupled to said output shaft, cam means driven by said output shaft operably associated with said print means for moving said print means so as to print consecutive data, means responsive to the movement of said cam means to consecutively advance the print means,

item moving means coupled to said print means for passing an item to be printed before said print means to produce printed indicia upon said item as the item is moved therepast, and

means for energizing said drive means effective to bring said printing means into printing engagement with an item as the item is passed before said print means.

4,178,848

AUTOMATIC PLATE SUPPLYING DEVICE FOR USE IN AN OFFSET PRINTING MACHINE

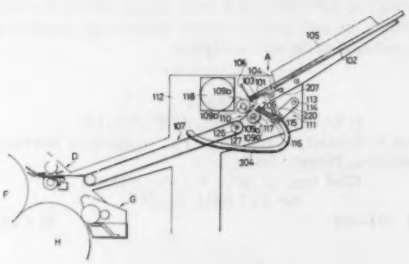
Koji Ishii, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 13, 1977, Ser. No. 806,127

Claims priority, application Japan, Jun. 14, 1976, 51/70021

Int. Cl.[2] B41F *7/00, 21/06;* B65H *3/08*

U.S. Cl. 101—142 **15 Claims**



1. An automatic plate supplying device for suplying plates sequentially to an offset printing machine including a pair of side walls, a drive motor disposed at one of the side walls and a plate conveying means driven by said motor, comprising:

(a) a plate storing means for supporting the plates in a stack having a bottom plate, said plate storing means being formed with a normally substantially closed opening through which the plates are to be drawn sequentially,

(b) a swingable suction means for sucking the bottom plate and transporting it to said conveying means, said swingable suction means comprising a pivotable member having a pivoting end and a swinging end, a swingable suction pipe in communication with a negative pressure source and mounted on the swinging end of said pivotable member, and a plurality of suction feet supported by said suction pipe in fluid communication therewith, said suction pipe and suction feet being rotatable with respect to said pivotable member,

(c) means for actuating said suction means to swing it between said plate storing means and said plate conveying means, and

(d) cam means driven by said driving motor for operating said swingable suction means and said means for actuating said suction means.

4,178,849

INKING DEVICE FOR LABEL PRINTING AND APPLYING MACHINE

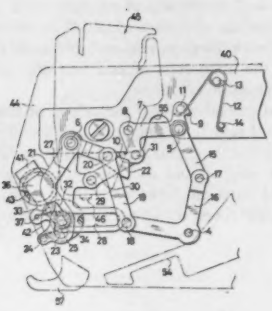
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Continuation-in-part of Ser. No. 813,291, Jul. 6, 1977, abandoned, which is a division of Ser. No. 787,937, Apr. 15, 1977. This application Sep. 2, 1977, Ser. No. 830,187

Claims priority, application Japan, Apr. 26, 1976, 51-46606; Jul. 6, 1976, 51-79440

Int. Cl.[2] B41J *3/60;* B41F *1/50*

U.S. Cl. 101—305 **13 Claims**



1. In a label printing machine, comprising a machine frame; said machine frame having a front end; a platen supported by said machine frame; a yoke movably supported by said machine frame for motion in a print direction toward said platen and in the opposite direction; said yoke being pivotally supported at a first pivot on said machine frame for pivotal motion with respect to said machine frame and extending from said first pivot toward said machine frame front end; a print head supported by and movable with said yoke, and including types opposable to and movable to said platen;

inking means for inking said types comprising:

an inking roller; a support for said linking

link means connecting said yoke and said inking roller support; said support holding said inking roller at one side, measured across said print direction, of said print head types before said yoke moves in said print direction; said link means moving said support to move said inking roller past said types in an inking direction, that crosses said print direction, as said yoke moves in said print direction, and said inking direction being directed into said machine frame such that when said types move to said platen, said inking roller is stowed inside said machine frame;

said link means comprises:

a first link including guide means for said support such that said support moves along and with respect to said guide means in said inking direction;

a second linkage connected with said support for moving said support in said inking direction along said guide means;

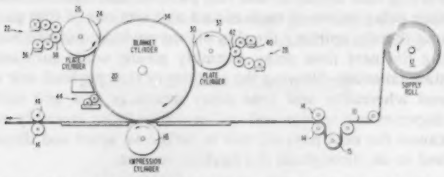
a third linkage connected with said first link for moving said first link generally in said inking direction and into said machine frame; said support remaining in engagement with said first link for being moved into said machine frame rearwardly from said machine frame front end with said first link;

said second and said third linkages being connected with said yoke for moving as described as said yoke moves in said print direction whereby the ink roller and support, as a result of the recited interconnection of the first link, the second and third linkages with the support, is given a motion in said inking direction faster than the motion of said first link in said inking direction.

4,178,850
METHOD AND APPARATUS FOR OFFSET PRINTING EMPLOYING FLUOROELASTOMERS

Richard W. Helmig, Garrison Forest Rd., Owings Mills, Md. 21117

Continuation of Ser. No. 602,908, Aug. 7, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,956
Int. Cl.[2] B41M *1/00*
U.S. Cl. 101—451 1 Claim

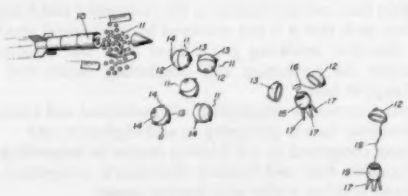


1. A method of lithographic printing comprising the steps of:
applying ink to a surface of a roller provided with a solid fluoroelastomer surface;
contacting a printing plate carried by a plate cylinder with water to apply water to the plate and with a surface of the roller to apply a film of ink to the plate from the roller;
moving the water and the ink bearing printing plate into contact with an image receiving surface of a transfer medium consisting essentially of a solid fluoroelastomer image receiving surface to transfer the film of ink in the form of an image from the printing plate to the image receiving surface of the transfer medium, the fluoroelastomer being resistant to swelling in lithographic printing and having ink receptivity sufficient to receive the ink from the plate in the form of a film without forming globules of ink in imprinted areas, and having ink release sufficient to release a major portion of the ink during subsequent transfer of the image from the blanket; and
transferring a major portion of the film of ink from the image receiving surface to another surface;
and wherein the fluoroelastomer image receiving surface of the transfer medium and the fluoroelastomer surface of the roller are each a copolymer of vinylidene fluoride and hexafluoropropylene.

4,178,851
DUAL PURPOSE MUNITION

Joseph F. Brady, Bethlehem, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 8, 1972, Ser. No. 233,831
Int. Cl.[2] F42B *25/02, 25/16*
U.S. Cl. 102—4 7 Claims



1. A dual purpose air deliverable submunition comprising:
a pair of hemispherical overlay shells;
means for releasably securing said hemispheres together;
means for spacially securing one of said hemispheres to a high explosive munition disposed in the plenum defined by said hemispheres and including therein;
a fragmentation outer shell having disposed therein,
an inertial fuze and booster for impact detonating,
a shaped high explosive charge,
standoff means carried by said munition for providing a standoff spacing between said munition and a target upon impact therebetween.

4,178,852
DELAY ACTUATED EXPLOSIVE DEVICE

Don H. Smith, Dallas, and Leslie W. Barton, Carrollton, both of Tex., assignors to Atlas Powder Company, Dallas, Tex.

Filed Aug. 29, 1977, Ser. No. 828,910
Int. Cl.[2] F42B *3/10*
U.S. Cl. 102—24 R 5 Claims

1. An explosive device for use with delay actuated explosives, adapted to be initiated by a detonator cord, comprising:
a water proof container for containing delay actuated explosives, said container having a substantially flat bottom section and a substantially cylindrical mid section, said mid section defining a U-shaped detonator receiving well along an outer surface thereof longitudinally along its length, said container also having a top portion integral with said mid section terminating at a threaded tubular neck;
a container cap having threaded means on the interior thereof adapted to threadably cooperate with threads on the neck of said container in sealing engagement therewith;
a tubular sleeve disposed about the mid section of the container and comprising a detonator cord conduit affixed thereto and offset from said detonator receiving well of said container;
a detonation delay unit having an initiating means adapted to be positioned proximate said detonator cord conduit and a delay detonating means for detonating said container, said delay detonating means communicating with said initiating means, and said delay detonating means being disposed in the detonator receiving well of said container;
a protective tape retaining means covering said detonator receiving well, and between said container and said tubular sleeve for holding said detonating means in position during ignition of the detonating cord passing through said detonating cord conduit; and
an alignment means removably affixed to the top of said container and extending over a portion thereof, said alignment means having a substantially cylindrical shape and comprising in the interior thereof, channel wall means for aligning said initiating means with said detonator cord conduit and for securing said delay detonator means within said detonator receiving well, when said alignment means is mounted onto said container, said alignment means also comprising an interior corridor parallel to the axis thereof, said corridor communicating with the detonating cord conduit affixed to said tubular sleeve, and a lip

formed by the top of said alignment means extending radially inwardly and having a plurality of air outlets for allowing the escape of air from the interior of said alignment means.

4,178,853

MILD DETONATING CORD CONFINEMENT

C. Gene Garrison, San Jose, and William Southern, Gilroy, both of Calif., assignors to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Continuation of Ser. No. 681,085, Apr. 28, 1976, Pat. No. 4,083,305. This application Apr. 11, 1978, Ser. No. 895,410

The portion of the term of this patent subsequent to Apr. 11, 1995, has been disclaimed.

Int. Cl.[2] **C06C** *5/00*

U.S. Cl. 102—27 R **9 Claims**

1. A mild detonating cord confinement comprising:

(A) An approximately 2.50 grain/foot metallic covered inner core of detonating high explosive material and means for confining the explosive effects without rupture when the explosive is detonating, further comprising:

(i) a layer of plastic fiber overbraid encircling said inner core;

(ii) a layer of foam encircling said overbraid, and

(iii) at least one layer of plastic fiber overbraid as an outer covering;

said mild detonating cord outer diameter being no larger than about 0.320 inches.

4,178,854

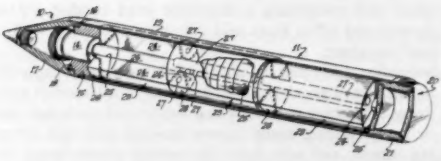
MULTIPLE SEQUENTIAL BURST SYSTEM

George H. Schillreff, Glendora, Calif., assignor to General Dynamics Corporation, Pomona Division, Pomona, Calif.

Filed Dec. 22, 1967, Ser. No. 692,995

Int. Cl.[2] **F42B** *13/42*

U.S. Cl. 102—89 CD **10 Claims**



1. In a decoy round containing at least a nose cone section, a payload section having at least two payload units, and a propulsion section; a multiple sequential burst system comprising a timing mechanism, a time delay assembly means positioned in each of said payload units, each of said payload units consisting of at least two sections, means within each of said payload units for separating said unit sections, fuzing means operatively connecting a first of said time delay assembly means with said timing mechanism for activating said time delay assembly means, fuze means interconnecting said time delay assembly means and extending adjacent an external surface of said payload unit section for splitting the skin of said payload section upon activation of said fuze means and for activating the next of said time delay assembly means, means operatively connecting said time delay assembly means with said payload unit separating means for activating same, time delay means within each of said payload unit sections for activating dispersing means for said unit sections, means for connecting said time delay assembly means with each of said unit section time delay means of the associated payload unit for activating said time delay means, whereby after a predetermined condition of flight of said round the timing mechanism initiates said multiple sequential burst system by activating said first of said time delay assembly means which in turn activates a first of said payload unit separating means and said interconnecting fuze means of said first payload unit and activates the time delay means of each of said unit sections of that payload unit thereby splittir ; the skin of said payload unit and activating the next time delay assembly means while substantially simultaneously blowing the sections of that payload unit apart and whereafter said time delay means of said unit sections disperses said section and said next time delay assembly means causes the next payload unit to be blown apart and dispersed and so on throughout the payload section.

4,178,855

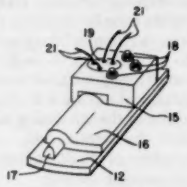
EXPLOSIVE ACTUATED ARMING SWITCH DEVICE

James V. McVay, and Patrick A. Yates, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1978, Ser. No. 890,561

Int. Cl.[2] **H01H** *39/00;* **F42C** *15/00*

U.S. Cl. 102—262 **9 Claims**



1. An arming system insensitive to mechanical shock which provides a predetermined arming signal upon termination of a preset electric current due to interruption by an explosive shock comprising;

an explosive for creating an explosive shock wave;

a frangible base in proximity to said explosive for sensing said explosive shock wave, such that said frangible base is shattered by said explosive shock wave;

conducting means affixed to said frangible base for transmitting said preset electric current except when said frangible base is shattered;

a resilient elastomeric compound placed between said frangible base and said explosive for cushioning said frangible base such that it is not shattered by mechanical shock;

an electrical insulating pad placed over said conducting means for protecting said conducting means and said frangible base;

housing means for supporting said cushioned and protected frangible base in proximity to said explosive; and

potting compound in said housing means for imbedding said frangible base and resilient elastomeric compound in a fixed position within said housing means.

4,178,856

WHEEL ASSEMBLY FOR OVERHEAD CONVEYOR

Martin Dunville, Dearborn Heights, Mich., assignor to Dearborn Fabricating & Engineering Company, Detroit, Mich.

Filed Jul. 3, 1978, Ser. No. 921,274

Int. Cl.[2] **B61B** *3/00;* **E01B** *25/22;* **F16C** *13/02*

U.S. Cl. 104—95 **4 Claims**

1. In an overhead conveyor including an I-beam having a web and a pair of side flanges, a pair of opposed centrally

interconnected brackets adapted to support a load, and a trolley wheel assembly journalled upon each of said brackets and movably mounted upon and along said flanges;

said wheel assembly comprising a cylindrical shell;

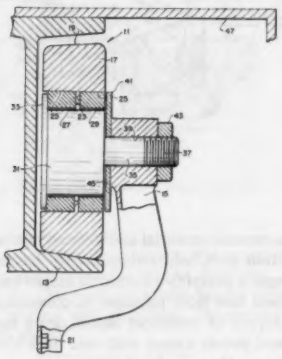
an annular shoulder flange at one end of said shell;

an axial shaft of reduced diameter relative to and extending from the other end of said shell, projected through the upper end of a bracket and secured thereto;

A hardened wheel having an axial bore;

an internal annular flange on said wheel intermediate the ends of said bore;

a pair of graphite alloy sleeve bearings press-fitted into said wheel bore and operatively engaging said wheel flange;



said bearings being loosely disposed upon said shell, with said shell flange loosely engaging one of said bearings and retaining said bearing against axial movement in one direction;

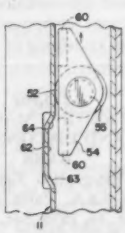
and a washer on said shaft between said shell and bracket loosely engaging the other bearing and retaining said bearing against axial movement in the opposite direction; said shell flange and said washer each having a diameter that is less that the diameter of said axial bore, such that said shell flange and said washer engage only said bearings, respectively, said sleeve bearings thus acting as both radial and thrust bearings.

4,178,857

RAIL HOUSE CAR DOOR WEAR SKIDS

Thorvald Madland, Arlington Heights, Ill., assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Nov. 25, 1977, Ser. No. 854,890
Int. Cl.[2] B61D *19/00;* **E05D** *15/10*
U.S. Cl. 105—378 **7 Claims**



1. In a rail house car having openings along its sides,

doors for closing said openings by movement along said car sides and laterally into and out of said openings,

bottom and top rotating crank means moveably supporting and retaining said doors adjacent the lower portions thereof on longitudinal track means and adjacent the upper portions thereof within longitudinal retainer means,

means to rotationally drive said crank means for selective lateral movement of said doors,

the improvement comprising:

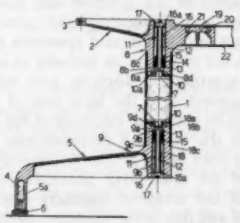
said top crank means adjacent the upper portion of said doors including skid means moveably engageable with the inner surface of said longitudinal retaining means when said doors are laterally substantially within said openings and roller means moveably engageable with the inner surface of said longitudinal retaining means when said doors are laterally substantially outside of said openings and free to move on said longitudinal track, thereby minimizing wear of said longitudinal retaining means by means of relative movement of said roller means and said longitudinal retaining means when said doors are laterally substantially within said openings and said rail house car is in motion.

4,178,858

DISASSEMBLABLE TABLE

Giulio Ponzellini, Bologna, Italy, assignor to Anonima Castelli S.p.A., Italy

Filed Dec. 16, 1977, Ser. No. 861,430
Claims priority, application Italy, Apr. 29, 1977, 49200 A/77
Int. Cl.[2] A47B *13/02*
U.S. Cl. 108—150 **11 Claims**



8. A table construction, comprising a vertical column having respective ends with a top cylindrical and bottom cylindrical cavity opening upwardly and downwardly respectively, an upright vertically extending securing bolt centrally arranged in each top and bottom cavity and secured to the inner end of said column, a plurality of table top supporting arm members each having a central sector portion engageable in said top cavity and disposed in side by side relationship around the respective securing bolts in said top cavity, each table top supporting arm member having a table top support arm extending radially outwardly from the top of said column, a plurality of foot members, each having a central vertical sector portion disposed in the bottom cylindrical cavity in side by side relationship around the respective securing bolt in said bottom cavity, an elastic sleeve disposed around each securing bolt between said securing bolt and said sector portions of the respective top supporting arm members and said foot members, and threaded clamping means connected to said bolt and to said elastic sleeve and being threadable on said bolt to act on said sleeve to engage it between said clamping bolt and said sector portions to hold respective sector portions in said column.

4,178,859

DOOR-LIKE CLOSURE

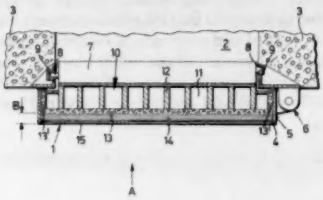
Rudolf Seiz, Herrsching; Heinz Eickhoff, Bochum; Herbert Meyer, Bochum, and Dieter Steppke, Bochum, all of Fed. Rep. of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Aug. 30, 1977, Ser. No. 829,256

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639691

Int. Cl.[2] E05G *1/026*

U.S. Cl. 109—27 **15 Claims**



1. An improved high-security door structure of the type only slowly destructible by non-explosive mechanical, thermal and chemical attack and comprising a door frame and means mounting the door frame for movement between closed and open positions, a multi-layer metallic protective front plate of uninterrupted surface area mounted on the door frame and being of the type only slowly destructible by non-explosive mechanical, thermal and chemical attack but destructible by discharge of locally applied explosive material and a metallic door plate of uninterrupted surface area mounted on the back side of the door frame,

the improvement comprising:

a metal back-up grid constituted by regularly organized and interconnected solid portions defining intermediate themselves an array of regularly disposed empty apertures interiorly of the front plate and door plate portions has a width measured in the plane of said grid, the distance between any two neighboring solid portions amounts to 2.5 to 4 times said width, said apertures having such dimensions as not to permit an intruder to reach through a respective aperture the back-up grid being juxtaposed with and connected to the back side of the multi-layer protective front plate, the thickness of the back-up grid as measured in the direction perpendicular to the general plane of the door being at least substantially equal to the thickness of the multi-layer protective front plate, the apertures of the array of regularly disposed apertures being empty and due to the thickness of the grid having a depth measured in the direction perpendicular to the general plane of the door which is at least substantially equal to the thickness of the multi-layer protective front plate and serving upon the discharge of explosive material locally applied to a section of the front face of the protective front plate for taking up the explosive pressure shock generated at such section so as to permit explosive destruction of such section and dissipation of the local explosive pressure shock into the respective adjoining aperture so as to localize the damage to the protective front plate without substantial damage to the reminder of the back-up grid.

4,178,860

SOIL TREATMENT LIQUID INJECTION DEVICE

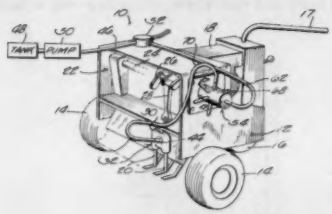
Charles E. Hines, and Dwight E. Williams, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 1, 1978, Ser. No. 874,159

Int. Cl.[2] A01C *23/02*

U.S. Cl. 111—7 **10 Claims**

1. A device for introducing soil treatment liquids into the ground, which device comprises a frame, a power source supported by said frame, means supporting said frame for movement along the ground, a plurality of injection tines each including a downwardly directed tip portion and mounted for reciprocative movement between a raised position wherein said tip portion is located above the ground surface and an injection position wherein said tip portion is located beneath the ground surface, each of said tines further including a flow passage, at least one injection port in said tip portion communicating with said flow passage for dispensing the treatment liquid into the soil when said tine is located beneath the ground surface, said tip portion having an outermost tip made from a



high alumina ceramic material and located below and adjacent to said injection port, said outermost tip having a generally spherical shape, a plurality of conduit means each connecting selected of said tine flow passages in communication with a pressurized supply of treatment liquid, drive means drivingly connecting said power source with said tines for reciprocating said tines between the raised and injection positions, and means for selectively controlling the flow of treatment liquid from the supply to each of said tine flow passages so that treatment liquid is supplied at a predetermined pressure to each of said tine flow passages only when the respective tine is in the injection position.

4,178,861

METHOD FOR THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL IN AN AMINE DELIGNIFYING LIQUOR CONTAINING A QUINONE OR HYDROQUINONE COMPOUND

Naphtali N. Vanderhoek, Doncaster; Peter F. Nelson, Kew, and Alan Farrington, Donvale, all of Australia, assignors to Australian Paper Manufacturers Limited, Melbourne, Australia

Filed Dec. 13, 1977, Ser. No. 860,058

Claims priority, application Australia, Dec. 13, 1976, PC8476

Int. Cl.[2] D21C *1/00, 3/22, 3/26*

U.S. Cl. 162—72 **14 Claims**

10. A process for the delignification of lignocellulosic raw materials in the production of cellulosic pulps suitable for use in the manufacture of paper or paperboard and the like, which consists of cooking said lignocellulosic raw materials with a quinone or hydroquinone compound in an essentially non-aqueous cooking liquor consisting of an amine.

4,178,862

PROGRAMMED SEWING MACHINE WITH TWO CONNECTABLE AND DISCONNECTABLE NEEDLE BARS

Nereo Bianchi, and Piergentino Zatti, both of Pavia, Italy, assignors to Necchi, S.p.A., Pavia, Italy

Filed Apr. 14, 1975, Ser. No. 568,027

Claims priority, application Italy, Apr. 12, 1974, 42903 A/74

Int. Cl.[2] D05B *19/00, 1/08*

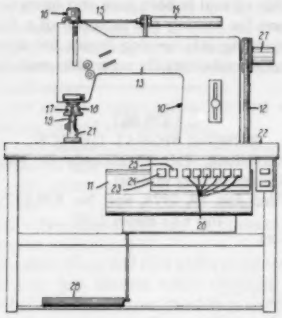
U.S. Cl. 112—121.11 **2 Claims**

1. In a sewing machine with two connectable and disconnectable needle bars the combination of a motor of the "motor-stop" type having a low and high speed, a keyboard programmer on the sewing machine assembly to select the needle bar to

be disconnected and the stitches number to be sewn at low speed with one needle only, and control means connected to said programmer and to said motor-stop, said combination being so arranged to execute automatically, in changing of the sewing direction, a series of operations as follows:

(a) disconnecting one needle bar;

(b) operating the needle bar to sew a few stitches at low speed in the first direction;



(c) shutting down the machine;

(d) operating the needle bar to sew the same number of stitches as in stage (b) in the second direction;

(e) connecting the disconnected needle bar for restarting the two-needle sewing and switching the sewing machine back on high speed.

4,178,863

FEED CAM REPHASING DEVICE

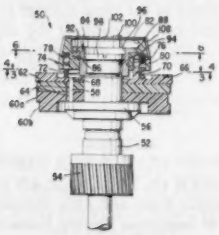
Donald Lawrie, Clydebank, Scotland, assignor to The Singer Company, New York, N.Y.

Filed Mar. 1, 1979, Ser. No. 16,636

Claims priority, application United Kingdom, Dec. 20, 1978, 49195/78

Int. Cl.² D05B *3/02, 3/04*

U.S. Cl. 112—158 D **3 Claims**



1. A sewing machine comprising a frame; a needle bar supported in said frame for endwise reciprocation and lateral oscillation; a work feeding system supported in said frame for urging work material in a direction transverse said lateral oscillation of said needle bar; said frame further supporting at least one first cam, first means operatively connecting said at least one first cam to said needle bar for influencing lateral oscillation thereof, a second cam, a second means operatively connecting said second cam to said work feeding mechanism for regulating the direction and rate at which work material is urged, and drive means for urging said needle bar in endwise reciprocation, for operting said work feeding system and for driving said first and second cams, and means for supporting said second cam for selective rotative repositioning to a first and second position relative to said at least one first cam, said support means including a cam shaft, means for mounting said second cam on said cam shaft in a fashion to accomodate selective rotative repositioning of said second cam, a repositioning bushing affixed to said cam shaft, and an actuator interposed between said bushing and said second cam, said actuator and said bushing having interacting means thereon for maintaining a selected one of a plurality of possible angular relationships between said actuator and said bushing, means for connecting said actuator to said second cam for rotation therewith and for limited axial movement of said actuator to and from said second cam, resilient means for biasing said actuator into engagement with said positioning bushing in a selecting one of said plurality of angular relationships of said actuator and said bushing whereby movement of said actuator against the urgings of said resilient means will disengage the interacting means from engagement in said selected one of said plurality of possible angular relationships to permit rotative repositioning of said actuator and said second cam to obtain reengagement of said interacting means in another of said plurality of possible angular relationships.

4,178,864

LOOPER CONTROL APPARATUS FOR SEWING MACHINES

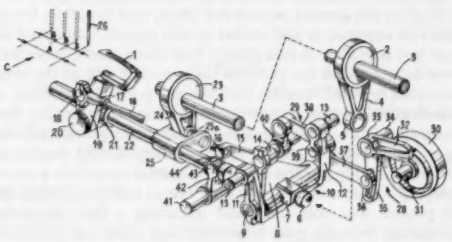
Ulderico Marcandalli, Milan, Italy, assignor to Rockwell-Rimoldi, S.p.A., Milan, Italy

Filed Oct. 6, 1977, Ser. No. 840,084

Claims priority, application Italy, Nov. 2, 1976, 28954 A/76

Int. Cl.² D05B *3/00, 57/32*

U.S. Cl. 112—159 **2 Claims**



1. A looper control apparatus for chain stitch sewing machines having a needle laterally movable to positions to form zig-zag stitches in a workpiece and a looper support bracket for controlling movement of the machine's looper to and from operative associaton with the needle in each of its stitch forming positions, said looper control apparatus comprising:

(a) a first drive device connected to the looper support bracket including;

(i) a control device (**28**);

(ii) a forked support bracket (**10**) operatively connected to said control device having an oscillatably driven looper drive lever (**8**) pivotably mounted therein for effecting oscillating movement of the looper in a direction perpendicular to the direction of travel of the workpiece and to maintain the looper in alignment with the needle in each of its lateral positions.

(b) a second drive device connected to the looper support bracket and functioning in timed sequence with said first drive device including:

(i) a linking apparatus (**29**) interconnecting said forked support bracket (**10**) with a driven shaft (**22**) on which the looper support bracket is mounted for effecting longitudinal movement of said driven shaft and move the looper to and from operative association with the needle in a plane parallel to that which it traveled to form each preceeding stitch; and

(c) said control device (**28**) including a grooved cam (**30**) having a follower arm (**32**) of a bell crank lever (**33**) connected thereto and a link member (**37**) operatively inter-

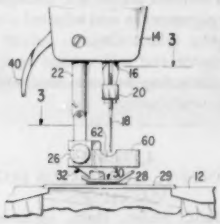
connecting the latter with said forked support bracket (10) and linking apparatus (29).

4,178,865

FINGER GUARD FOR SEWING MACHINES

Charles R. Odermann, Montville, and Ralph E. Johnson, Convent Station, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jun. 30, 1978, Ser. No. 921,032
Int. Cl.[2] D05B 29/12, 83/00
U.S. Cl. 112—261 4 Claims



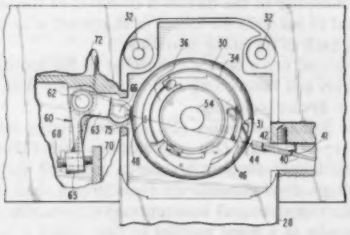
1. A finger guard for a sewing machine having a needle bar; a needle fastened to said needle bar; a presser bar a presser foot shank having a socket fastened to said presser bar; a presser foot having a work engaging sole plate formed with bifurcated toe portions; detachable connection means comprising a cylindrical pivot pin carried on said sole plate, said pivot pin being resistively engaged in said socket of said presser foot shank to fasten said sole plate to said presser foot shank, said connection means locating said toe portions one on each side of the area penetrated by said needle; said finger guard comprising a mounting portion and a body portion; means for securing said mounting portion to said presser bar; said body portion of said finger guard being joined at one extremity to said mounting portion; said body portion being shaped so as to enclose a space overlying and accommodating only one of said toe portions of said presser foot sole plate and including a free extremity terminating between said bifurcated sole plate toe portions; whereby the other of said presser foot sole plate toe portions is accessible outside the space enclosed by said body portion of said finger guard so that said other toe portion may be grasped and rotated upwardly for disengagement of said presser foot from said shank.

4,178,866

ADJUSTABLE BOBBIN THREAD RUN-OUT INDICATOR

Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,614
Int. Cl.[2] B65H 63/08; D05B 51/00
U.S. Cl. 112—278 4 Claims



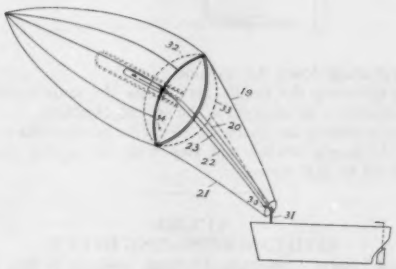
1. A lockstitch sewing machine having a frame, said frame supporting sewing instrumentalities including a needle carrying needle bar supported by said frame for endwise reciprocation, a feed system for urging work material in a path under said needle, a looptaker supported in said frame for cooperation with said needle in the formation of stitches, and a bobbin case supported by said looptaker, said bobbin case supporting therein a bobbin having a pair of flanges separated by a thread carrying hub; wherein the improvement comprises; an adjustable bobbin thread run-out indicator including a light source, means for extending light rays from said light source adjacent said hub of said bobbin between said flanges thereof, means on the opposite side of said bobbin case and looptaker from said extending means for sensing the presence of a light ray, and, means for supporting said sensing means for selective movement in a direction substantially normal to said light rays.

4,178,867

RESCUE SIGNAL DEVICE

Ji Y. Shyu, Kaohsiung, Taiwan, assignor to Yin-Lung Yang, Kangshan, Taiwan, a part interest

Filed Jan. 19, 1978, Ser. No. 870,817
Int. Cl.[2] B64B 1/50
U.S. Cl. 114—39 4 Claims



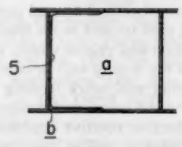
1. A rescue signal device used for a lifeboat and other objects comprising an inflatable balloon in cone shape with one end flat like a cut football, a circular board made of thicker material than the balloon, having a circular frame secured to a circular skirt at the flat end of the balloon, said circular board being linked to the boat or object by four cables which are fastened equally apart to the circular frame of the circular board, the other end of the cables being fastened to a follow-up wheel on the boat or other object in the same manner as to the circular board, said wheel and cables changing the angle of attack of said board relative to the wind, thus operating the board as a sail to co-operate with the rudder of the boat to achieve a desired heading.

4,178,868

METHOD AND APPARATUS FOR DISPLACING OIL AND SEAWATER IN TANKS OF AN OIL TANK

Jinya Iizuka; Seinosuke Kato, and Akio Matsuda, all of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Continuation of Ser. No. 770,144, Feb. 18, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 887,915
Int. Cl.[2] B63B 25/12
U.S. Cl. 114—74 R 6 Claims



1. An apparatus for displacing oil and seawater in an oil

tanker having a plurality of sealed compartments, each having a deck plate, side walls and bottom plate, comprising:

(a) a single partition membrane made of oil-resistant and chemically stable flexible material clamped to the compartment in a liquid seal arrangement, said membrane dividing the compartment into a first section adapted to be filled with oil and a second section adapted to be filled with seawater, said membrane configured to contact opposite sides of said compartment, said membrane being connected at one end to the upper surface of the compartment and at the opposite end to the lower surface of said compartment, the surface area of one side of said membrane being substantially one-half the inner surface area of said compartment,

(b) a first port means connected to the first section at an upper portion of said compartment,

(c) a second port means connected to the second section at a lower portion of said compartment,

(d) a first valve means adapted to connect said first port means to oil,

(e) a second valve means adapted to connect said second port means to seawater, and

(f) means for controlling said first and second valve means to discharge said first section while charging said second section wherein said compartment is maintained in a full condition.

4. In a method for displacing oil and seawater in an oil tanker, said tanker having a plurality of sealed compartments having therein a single flexible membrane configured to contact opposite sides of said compartment, said membrane dividing said compartment into a first section adapted to be filled with oil and a second section adapted to be filled with seawater, and valve means for the supply and discharge of oil through first port means at upper portions of said compartments, valve means for the supply and discharge of seawater through second port means at lower portions of said compartments, comprising the steps of: supplying oil through first port means at an upper portion of said compartment while simultaneously discharging water through second port means at a lower portion of said compartment and then supplying water through said second port means at a lower portion of said compartment while discharging oil through said first port means at said upper portion of said compartment to maintain said compartment in a full condition wherein, when filled with oil said membrane will contact one wall of said compartment and when said compartment is filled with seawater said membrane will contact an opposite wall of said compartment, said membrane being connected at one end to the upper surface of the compartment and at the opposite end to the lower surface of said compartment, the surface area of one side of said membrane being substantially one-half the inner surface area of said compartment.

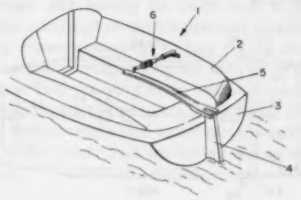
4,178,869

COMBINED REMOVABLE TILLER EXTENSION HOLDING AND CONTROLLING DEVICE FOR WATERCRAFT

Fred C. Turrentine, 14201 SE. Parmenter, Milwaukie, Oreg. 97222

Filed Apr. 27, 1978, Ser. No. 900,348
Int. Cl.[2] B63H *25/52*
U.S. Cl. 114—172 **6 Claims**

1. In a tiller tender and holding device for sail boats and the like, including a rudder with an inwardly projecting tiller, a transversely and generally horizontally disposed tubular connecting member interposed between an end of said tiller and a side wall of said sail boat, said member having downwardly disposed pins pivotally arranged in opposing ends thereof, and sockets in said tiller and side wall for removably receiving said pins whereby said tiller is retained in a generally longitudinally extending and neutral on course position, said member having sleeved tubular sections, threaded elongated screw rod means arranged in said sections, control sleeve means arranged on one of said tubular sections and fixedly connected to said screw rod means, a first piston means fixed on one end of said rod means, a second piston means threadedly arranged on said rod means in spaced relation to said first piston means, bearing means spacedly arranged on said rod means between said spaced piston means, spacer means fixedly arranged on said rod means intermediate said spaced bearing means with one of



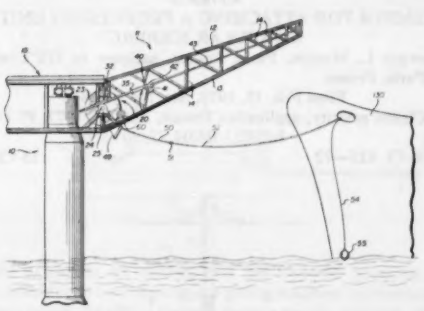
said tubular sections and said control sleeve means being anchored to said spacer means, and spring means arranged on said rod means whereby manual rotation of said control sleeve means rotates said rod means longitudinally and adjusts the length of said tubular connecting member and controls the lateral steering movement of said tiller.

4,178,870

MOORING LINE HANDLING APPARATUS

Jack Pollack, Winfield, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 12, 1978, Ser. No. 868,814
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 **29 Claims**



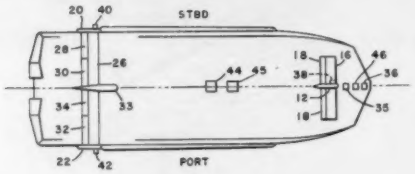
3. In combination:

a mooring station and a ship moored thereto by a first line, the mooring station comprising a structure having thereon a pinion gear and a large diameter sheave, with the pinion gear and the large sheave axially mounted to a shaft secured to a base on the structure, a first line wrapped for at least part of its length on the large sheave and connected to and extending to the ship, and a plurality of elastic lines of equal length extending from an anchor means on the structure to means connected to the pinion gear for yieldably resisting rotation, by means of the elasticity of the elastic lines, of the large sheave and unwrapping of the first line therefrom when the load applied to the first line is increased as the distance between the ship and structure is increased.

4,178,871
AUTOMATIC CONTROL SYSTEM FOR HYDROFOIL CRAFT

Irving A. Hirsch, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 23, 1974, Ser. No. 435,672
Int. Cl.[2] B63B *1/18*
U.S. Cl. 114—275 6 Claims

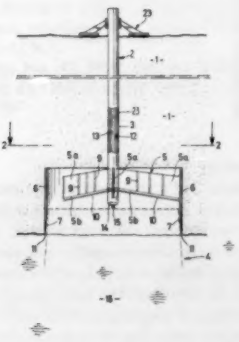


1. In a control system for a hydrofoil craft of the type having at least one control surface, the combination of:
electrical circuit means including a primary servo system for controlling said surface during normal operation of the hydrofoil,
auxiliary electrical circuit means including a secondary servo feedback system preset to position said surface to cause said hydrofoil craft to descend from a foil-borne to a hull-borne mode of operation,
first and second sensing means for sensing motion of the craft about its roll axis and providing output signals in response thereto,
means for comparing the output signals of said first and second sensing means, and
means responsive to a predetermined difference between said signals for disabling said primary servo system and enabling said secondary servo feedback system to position said surface to cause said hydrofoil craft to descend from a foil-borne to a hull-borne mode of operation.

4,178,872
MEMBER FOR ATTACHING A PROPULSION UNIT TO A TABULAR ICEBERG

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Feb. 15, 1978, Ser. No. 877,844
Claims priority, application France, Apr. 14, 1977, 77 11276
Int. Cl.[2] B63H *21/30*
U.S. Cl. 115—72 15 Claims

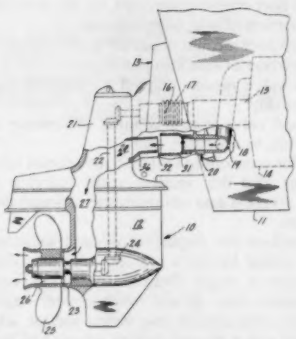


1. A member for attaching an underwater propulsion unit to the substantially horizontal lower surface of a tabular iceberg, the member comprising a central tube and a ring attached to a central hub by fins, the hub forming a removable nose of the central tube which serves for lining a bore made through the iceberg by operation of the member, and the torpedo including heating means whereby, in operation, it melts the ice of the iceberg and sinks therethrough with the ice re-freezing above it.

4,178,873
EXHAUST COUPLING ASSEMBLY FOR A MARINE STERN DRIVE

Herbert A. Bankstahl, Fond Du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 6, 1978, Ser. No. 875,447
Int. Cl.[2] F01N *3/00*
U.S. Cl. 115—73 10 Claims



1. A stern drive for propulsion of a boat including
(A) an inboard engine having an exhaust passageway means,
(B) an outboard driven unit coupled to the engine having an exhaust passageway means,
(C) a transom mounting assembly including pivot mounting means positioned between the inboard engine and the drive unit, the pivot mounting means including a vertical pivot axis for steering of the drive unit and a horizontal pivot axis for trimming of the drive unit, the improvement which comprises
(a) a first exhaust pipe connected to said inboard engine exhaust passageway means and extending outward through the transom of a boat and having an open end position centered on, adjacent said vertical pivot axis, and below said horizontal pivot axis
(b) a second exhaust pipe connected to said exhaust passageway means of said drive unit, said second exhaust pipe pivoting with the trim movement of the drive unit and extending towards and ending in alignment with said end position of said first exhaust pipe to form an interface therebetween which includes an opening therebetween providing a substantially equal exhaust leakage over the entire pivotal steering movement of the drive unit for any given trim position of the drive unit.

4,178,874
ROADSIDE EMERGENCY SIGNALLING DEVICE

Michael S. Berns, and William J. Chafe, both of c/o Messrs. Mann & Macera, Suite 1, 201 McLeod St., Ottawa, Ontario, Canada (K2P 0Z9)

Filed Jun. 13, 1978, Ser. No. 915,154
Int. Cl.[2] G09F *21/04*
U.S. Cl. 116—28 R 5 Claims

1. An information and signalling device for use on downwardly openable windows, said device having a collapsed mode and a constructed mode, comprising:
(a) a first semi-rigid or rigid substantially rectangular panel having a top flange extending rearwardly over said window when suspended therefrom a distance greater than the window thickness;

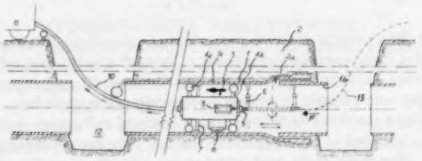
(b) a second semi-rigid or rigid substantially rectangular panel substantially the same size as said first panel having its top affixed to said top flange on said first panel, and having a sign retaining means to hold information signs and signalling signs, said first and second panels parallel to the window when suspended therefrom;
(c) a third semi-rigid or rigid substantially rectangular panel having an information/signalling sign display means adaptable to visibly display information signs and signalling signs when the device is in the constructed mode;
(d) first flexible hinge means connecting one side of said third panel to one side of said first panel;
(e) fourth semi-rigid or rigid substantially rectangular panel having an information/signalling sign display means adaptable to visibly display information signs and signalling signs when the device is in the constructed mode on the window;
(f) second flexible hinge means connecting one sign of said fourth panel to the side of the third panel opposite said first flexible hinge means;
(g) engaging means to lockingly engage the other side of said fourth panel to the other side of said first panel;
(h) a plurality of information signs and signalling signs adapted to be removably connected to said information/-signalling sign display means and to said sign retaining means;
wherein said device, when in the constructed mode and on a window, has a substantially triangular configuration visibly displaying a predetermined signalling sign or information sign on said third and fourth panels.

4,178,875

APPARATUSES FOR PRODUCING TIGHT JOINTS OR SEALS IN UNDERGROUND PIPELINES

Armando Moschetti, Milan, Italy, assignor to Siargas — Societa' Italiana Assistenza Reti Gas S.p.A., Milan, Italy

Filed Nov. 30, 1977, Ser. No. 856,577
Claims priority, application Italy, Nov. 15, 1977, 29709 A/77
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—712 **9 Claims**



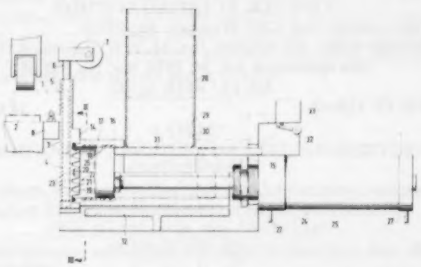
1. An underground pipeline repair apparatus positionable inside an underground pipeline for producing an internal tight joint at a socket juncture between two pipes of an underground pipeline, said repair apparatus comprising a carriage, at least two angularly spaced sets of radially extendable rolling members mounted on the carriage to be engageable with the inner surface of the pipeline to support the carriage, retractable radially extending anchoring means, actuator means for said anchoring means for selectively moving said anchoring means radially to forcefully engage the inner surface of the pipeline for preventing movement of the carriage with respect to the pipeline, a plurality of reservoirs of synthetic components, a longitudinal support member mounted for axial reciprocation on said carriage and having an outer end, a spray head mounted on the outer end of the longitudinal support member, a first driving means connected to said rolling members for rapidly moving said carriage along the interior of said underground pipeline, said spraying head being connected to said reservoirs for receiving the contents thereof and second driving means for reciprocating said longitudinal support member at a variable speed when said anchoring means is in an extended position.

4,178,876

APPARATUS FOR MELTING AND APPLYING A FUSION ADHESIVE

Walter Nicklas, Nuertingen-Oberensingen; Dietrich Hesler, Frickenhausen, and Gerhard Gresser, Oberboihingen, all of Fed. Rep. of Germany, assignors to Firma Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,570
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731799
Int. Cl.[2] B05C *1/00*
U.S. Cl. 118—681 **14 Claims**

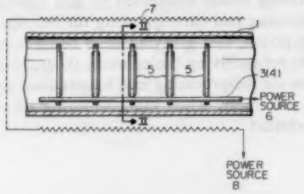


1. An apparatus for melting and mechanically applying a fusion adhesive to a workpiece in a gluing machine, comprising chamber means (**16, 35**), a fusion adhesive supply aperture (**30**) in said chamber means, heatable melting wall means (**22, 36**) forming part of said chamber means at one end thereof, said heatable melting wall means comprising outlet holes for the molten fusion adhesive, said apparatus further comprising supply piston means movably supported inside said chamber means, feed unit means operatively connected to said supply piston means, and fusion adhesive magazine means for holding fusion adhesive units (**28**) operatively located relative to said supply aperture (**30**) for supplying a fusion adhesive unit from said magazine means through said supply aperture into said chamber means when said supply piston means is in a retracted position whereby said supply piston means is enabled to press fusion adhesive against said heatable melting wall means when said supply piston means are moved out of said retracted position to melt only that quantity of adhesive which is presently needed.

4,178,877
APPARATUS FOR PLASMA TREATMENT OF SEMICONDUCTOR MATERIALS

Daiziro Kudo, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed Mar. 13, 1978, Ser. No. 885,996
Claims priority, application Japan, Mar. 11, 1977, 52-26862
Int. Cl.[2] H01L *21/306;* C03F *00/00*
U.S. Cl. 118—728 19 Claims



8. An apparatus for plasma treatment of a plurality of pieces of material, said treatment comprising at least one treatment selected from coating and etching, said apparatus comprising:

a reaction tube;

means for introducing a gas comprising a reaction gas into said reaction tube,

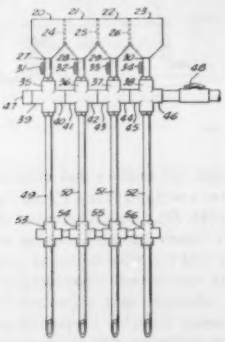
a plurality of conducting electrode plates located in said reaction tube, the number of each said electrode plates corresponding to the number of said pieces, each of said plates comprising means for supporting the corresponding one(s) of said pieces, said plates being oriented parallel to each other and transversely to said reaction tube,

means for applying voltage across adjacent ones of said plates to create a plasma with said reaction gas for effecting said treatment.

4,178,878
FISH EGG PLANTING METHOD

Tod A. Jones, Box 1288, Wrangell, Ak. 99929

Division of Ser. No. 806,445, Jun. 14, 1977, Pat. No. 4,130,086.
This application Jul. 24, 1978, Ser. No. 927,357
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 14 Claims



1. Method of planting fertilized fish eggs in a stream or lake bed substrate which comprises the steps of:

subjecting the substrate to high pressure hydraulic flushing with a flushing device to loosen gravel and remove sediment prior to deposition of the fertilized fish eggs;

selecting the depth at which to deposit fertilized fish eggs in the flushed substrate; and

depositing said fertilized fish eggs into the flushed substrate at the depth previously selected, said depositing being accomplished with a flushing device.

4,178,879
RESTRAINING DEVICE FOR ANIMALS

Louise B. Cunningham, 1505 N. 22nd St., Corsicana, Tex. 75110

Filed Sep. 26, 1977, Ser. No. 836,483
Int. Cl.[2] A01K *27/00;* G09F *3/08*
U.S. Cl. 119—106 10 Claims

1. A restraining device for animals comprising in combination:

a flexible belt member having attachment means thereon for removably securing the belt member about said animal;

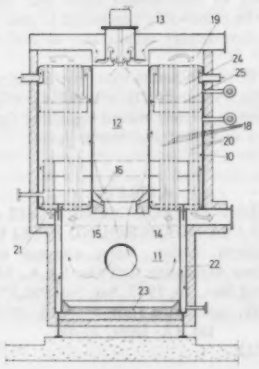
said belt member having a transparent face along one side of the belt member lying substantially flush with the belt member and extending along most of the length of the belt member to form an elongated pouch said transparent face being attached about its periphery to said belt member and having a transverse slotted aperture in the transparent face near one end of the pouch opening into said pouch; and

a flexible strip removably inserted in said pouch and extending substantially the entire length of the pouch, said strip having removable indicia along one face visible through the transparent face on said belt.

4,178,880
FURNACE

Nils Östbo, Volrat Thamsgatan 4, Goteborg, Swéden (41278)

Filed Oct. 27, 1977, Ser. No. 845,972
Claims priority, application Sweden, Nov. 11, 1976, 7612550; Nov. 11, 1976, 7612551; Nov. 11, 1976, 7612552
Int. Cl.[2] F22B *7/12*
U.S. Cl. 122—182 S 1 Claim



1. In a vertical furnace comprising a smooth-walled fire tube and a final combustion chamber located axially downstream thereof, said fire tube having means for mounting a burner at its upper end remote from said final combustion chamber,

(A) a partition wall including a body of refractory material, adapted to be mounted in the fire tube for separating said fire tube from said combustion chamber, said partition wall, towards the fire tube being defined by a smooth surface sloping towards its centre,

(B) a restricted area passage, centrally located in said partition wall, and

(C) a number of grooves, open towards the fire tube in said sloping surface and directed tangentially with respect to an imaginary circle, inscribed within said passage, said

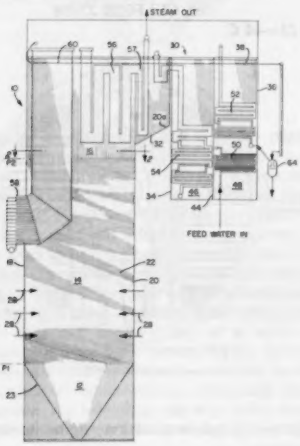
grooves being formed with a cross-sectional area, tapering in the direction from the smooth wall of the fire tube towards said passage to thereby increase the flow velocity of the on-flowing gases.

4,178,881

VAPOR GENERATING SYSTEM UTILIZING ANGULARLY ARRANGED BIFURCATED FURNACE BOUNDARY WALL FLUID FLOW TUBES

Harry H. Pratt, West Orange, N.J., and David Cranstoun, Spring Valley, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 16, 1977, Ser. No. 861,388
Int. Cl.[2] F22B *29/02;* F22D *7/00*
U.S. Cl. 122—235 A **8 Claims**



1. A vapor generator comprising an upright furnace section the boundary walls of which are formed by a plurality of tubes and means for passing fluid through said tubes to apply heat to said fluid; a first portion of said tubes extending substantially vertically in the lower portions of said boundary walls, a second portion of said tubes extending substantially vertically in the upper portions of said boundary walls and a third portion of tubes extending at an acute angle with respect to a horizontal plane in the intermediate portions of said boundary walls; and a plurality of bifurcates extending in said boundary walls, said bifurcates connecting one tube of said third portion of tubes of two tubes of said first portion of tubes and connecting one tube of said third portion of tubes to two tubes of said second portion of tubes; said tubes and said bifurcates have fins extending outwardly from diametrically opposed portions thereof, with the fins of adjacent tubes and adjacent bifurcates being welded together to form a gastight structure.

4,178,882

HYDROGEN FUEL SUPPLY SYSTEM

Vaughn R. Anderson; Ronald L. Woolley, and Edward H. Davis, all of Orem, Utah, assignors to Billings Energy Corporation, Provo, Utah

Filed Jan. 20, 1978, Ser. No. 871,094
Int. Cl.[2] F02B *43/10*
U.S. Cl. 123—1 A **8 Claims**

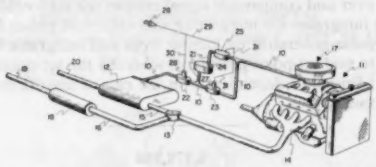
1. A hydrogen fuel supply system in combination with an internal combustion engine having feed means for feeding gaseous hydrogen to the intake manifold thereof, said fuel system comprising:

a fuel tank containing a metal hydride which is capable of reacting with and adsorbing hydrogen at a given temperature and pressure, and of releasing hydrogen gas at least under one of the conditions of a temperature higher than said given temperature or a pressure lower than said given pressure;

a supply conduit connected between said fuel tank and said feed means of said engine for flow of gaseous hydrogen from said fuel tank to said feed means;

a bypass conduit having one end thereof connected to the supply conduit at a point between said tank and said feed means, and having its other end connected to the supply conduit downstream from the connection of said one end to said supply conduit;

a pressure regulator in combination with said bypass conduit, said pressure regulator being capable of regulating the pressure downstream thereof at a preset value when the pressure upstream thereof is greater than the preset value and of allowing the pressure downstream to decrease below the preset value when the pressure upstream is below the preset value;



valve means in combination with the supply conduit and the bypass conduit, said valve means being adapted to either direct the flow of hydrogen gas directly through the supply conduit or to divert the flow of hydrogen gas from the supply conduit through the bypass conduit and back to the supply conduit downstream from the valve means;

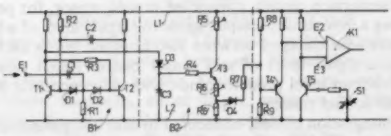
a pressure actuated controller adapted to monitor the pressure downstream from said regulator, said controller also being adapted to control said valve means so that hydrogen flows through the bypass conduit when the monitored pressure is greater than a second preset pressure of said regulator, and said controller also being adapted to control said valve means so that hydrogen flows directly through the supply conduit when the monitored pressure is less than said second preset pressure.

4,178,883

METHOD AND APPARATUS FOR FUEL/AIR MIXTURE ADJUSTMENT

Harro Herth, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,140
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702863
Int. Cl.[2] F02B *3/08;* F02M *7/12;* F01N *3/08*
U.S. Cl. 123—32 EE **8 Claims**



1. A method for adjusting the operating point of a fuel mixture control system of an internal combustion engine, said mixture control system including a fuel mixture generator, an exhaust gas sensor for providing an actual value signal and a set-point signal generator, said actual valve signal and said set-point signal being compared in a comparator circuit which generates a comparator signal which is used by a final control element within said fuel mixture generator and wherein the improvement comprises the steps of:

(a) generating a correction signal which contains informa-

tion related to the frequency of amplitude alternations in the actual value signal provided by said exhaust gas sensor; and

(b) applying said correction signal to an input of said comparator to thereby adjust said set-point signal; whereby, when the engine load changes, the fuel-mixture ratio is changed from a first value to at least one second value distinct from said first value.

4. An apparatus for adjusting the operating point of a fuel mixture control system of an internal combustion engine, said mixture control system including a fuel mixture generator, an exhaust gas sensor for providing an actual value signal and a set-point signal generator, said actual value signal and said set-point signal being compared in a comparator circuit which generates a comparator signal which is used by a final control element within said fuel mixture generator and wherein the improvement comprises:

a pulse generator for generating an electrical pulse whenever said comparator signal crosses the zero voltage level;

an integrator for integrating said electrical pulses from said pulse generator, the output from said integrator being fed to said set-point generator; whereby the set-point signal is adjusted in dependence on the rate of mass flow through said engine.

4,178,884

METHOD AND SYSTEM TO CONTROL THE MIXTURE AIR-TO-FUEL RATIO

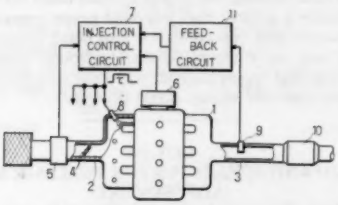
Hideaki Norimatsu; Akio Kobayashi; Akira Masuda, and Sigenori Kitajima, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 688,390, May 20, 1976, abandoned. This application Apr. 27, 1978, Ser. No. 900,505

Claims priority, application Japan, Jun. 5, 1975, 50-683201; Jun. 19, 1975, 50-70295; Jul. 23, 1975, 50-89857

Int. Cl.[2] F02B *3/00*; F02M *7/00*

U.S. Cl. 123—32 EE **10 Claims**



1. An air-to-fuel ratio control system for an internal combustion engine comprising:

a sensor, disposed in the exhaust pipe of an engine, for producing a sensor output signal having a signal level indicative of the air-to-fuel ratio of mixture supplied to said engine;

a comparison circuit, connected to said sensor, for producing a comparison output signal the signal level of which is stepwise changed between two constant levels each time said signal level of said sensor output signal reaches a constant level predetermined with reference to a desired air-to-fuel ratio;

an integration circuit, connected to said comparison circuit, for producing an integration output signal the signal level of which is increased and decreased with the time lapse while said signal level of said comparison output signal is kept at one and the other between said two constant levels, respectively;

a correction circuit, connected between said comparison circuit and said integration circuit, for stepwise correcting said signal level of said integration output signal in synchronism with the level change of said comparison output signal such that said signal level of said integration output signal is abruptly decreased and increased by a predetermined level when the changing direction of said integration output signal is reversed from the increasing to decreasing directions and from the decreasing to increasing directions, respectively; and

mixture supply means for supplying said engine with the mixture having an air-to-fuel ratio corrected in accordance with said signal level of said integration output signal.

4,178,885

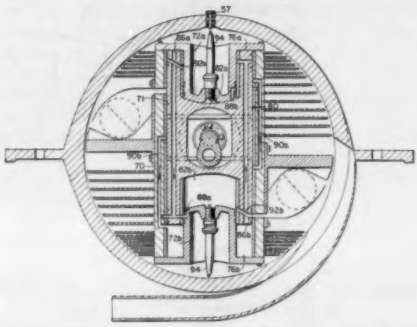
ROTARY PISTON/CYLINDER ENGINES

Siegfried Konther, Rua Azara; Sigfrido Konther Chamorro, Rua Cerro Cora, and Udi Konther Chamorro, Rua Cerro Cora, all of, San Lorenzo, Paraguay

Filed Jun. 20, 1977, Ser. No. 808,419

Int. Cl.[2] F02B *57/06*

U.S. Cl. 123—44 C **13 Claims**



1. A rotary internal combustion engine having a fuel inlet and comprising:

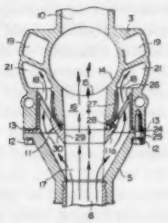
support means defining an axis of rotation and provided with static crankshaft means defining a crank axis which is offset from said axis of rotation; and

a rotor assembly which is mounted by said support means to rotate about said axis of rotation and comprises a double-headed piston member having two pistons at opposite ends respectively of an intermediate portion of the piston member and a double-headed cylinder member defining two cylinders in which the two pistons are fitted respectively to define two combustion chambers, the piston member and the cylinder member defining two precompression spaces in addition to the combustion chambers, the cylinder member being connected to said crankshaft means to rotate about the crank axis defined thereby and the piston member being rotatable about said axis of rotation, whereby each piston reciprocates relative to the cylinder in which it is fitted as the rotor assembly rotates about said axis of rotation, said piston member being formed with a bore extending therewithin and having said cylinder member fitted reciprocably therein, said piston member being provided with said two pistons projecting into the interior of the bore at the two ends respectively of the piston member, said cylinder member being formed at its two ends with respective cyinders in which said pistons are fitted respectively, and at least one of said members being formed with passage means which establish communication between the fuel inlet and the two precompression spaces and between the two precompression spaces and the combustion chambers respectively, and which enable gas to be exhausted from the combustion chambers, and wherein each precompression space is at the opposite end with respect to the intermediate portion from the combustion chamber with which it communicates by way of said passage means.

4,178,886
TWO STROKE ENGINES

Eizaburo Uchinishi, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Feb. 17, 1977, Ser. No. 769,700
Claims priority, application Japan, Feb. 18, 1976, 51-17709
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 A **8 Claims**

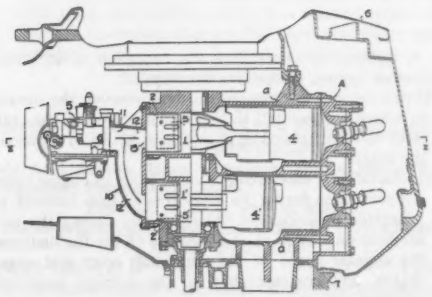


1. Two stroke engine comprising cylinder means, crankchamber means provided beneath the cylinder means, piston means disposed in said cylinder means for reciprocating movement, combustion chamber means defined in the cylinder means by said piston means, scavenging port means provided in said cylinder means and adapted to co-operate with said piston means so as to be cyclically opened to said combustion chamber means, scavenging passage means extending between said scavenging port means and said crankchamber means, intake port means provided in said cylinder means and adapted to co-operate with said piston means so as to be cyclically opened to said crankchamber means, intake passage means connected with said intake port means, auxiliary passage means extending between the intake passage means and said scavenging passage means and including one-way valve means which allows gas flow only toward the scavenging passage means.

4,178,887
INTAKE DISTRIBUTOR FOR TWO-CYCLE INTERNAL COMBUSTION ENGINES

Kazumi Iida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 12, 1977, Ser. No. 841,525
Claims priority, application Japan, Oct. 13, 1976, 51-138058
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 V **4 Claims**

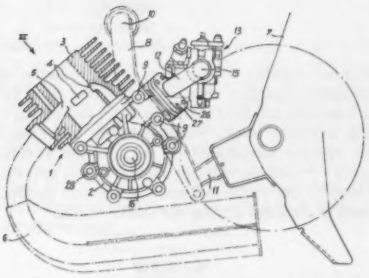


1. In combination with a two-cyclinder, two-cycle internal combustion engine, whose cylinders are substantially horizontal, and one of which lies directly above the other, each of said cylinders having a cylinder inlet port to receive air/fuel mixture to be combusted in the respective cylinder, an intake gas system comprising: only one carburetor for providing an air/fuel mixture for both of said cylinders; and a distributor comprising a conduit having a distributor inlet port receiving air/fuel mixture from said carburetor, and two branches, each leading to a respective one of said cylinder inlet ports, said distributor inlet port being disposed at an elevation nearer the upper one of the cylinder inlet ports, the cross-section of the cylinder inlet ports, the direction of flow from the distributor inlet port, and the length and cross-section of the branches being such as to provide substantially equal quantities of air/fuel mixture of substantially equal density to the two cyinder inlet ports in which the cross-section of the upper cylinder inlet port is smaller than the cross section of the lower cylinder inlet port.

4,178,888
CARBURETOR AND CRANKCASE ARRANGEMENT IN A SINGLE-CYLINDER TWO-STROKE ENGINE

Eric Jaulmes, Paris, France, assignor to Ateliers de la Motobecane S.A., Pantin, France

Filed May 2, 1978, Ser. No. 902,226
Claims priority, application France, May 6, 1977, 77 13836
Int. Cl.[2] F02B *33/04*
U.S. Cl. 123—73 V **2 Claims**



1. In a single-cylinder two-stroke engine having a carburetor and an intake tube leading into the crankcase through an intake valve, the elements of the engine being located between two relatively close planes perpendicular to the crankshaft axis, the improvement wherein the carburetor flow axis is essentially parallel to the crankshaft axis, wherein the intake valve is of the symmetric type, wherein the axis of the intake valve and the axis of the downstream part of the intake tube form an acute angle with the planes perpendicular to the crankcase axis, wherein the crankcase is formed of two parts having their joining plane perpendicular to the crankshaft axis, and wherein said joining plane of the two crankcase parts intersects the joining plane of the crankshaft and the intake valve nonperpendicularly, the intake valve being mounted on both crankcase parts.

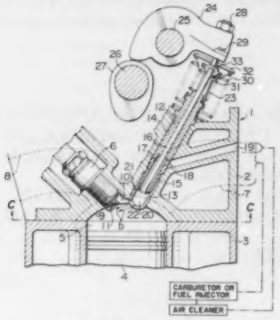
4,178,889
INTERNAL COMBUSTION ENGINE

Hirokazu Nakamura; Tsuneo Ohinouye, both of Kyoto; Kenji Hori; Yuhiko Kiyota, both of Nagaokakyo; Tatsuro Nakagami, Kyoto; Yutaka Tsukamoto, Jyoyo, and Katsuo Akishino, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1977, Ser. No. 789,709
Claims priority, application Japan, Jul. 12, 1976, 51-83113
Int. Cl.[2] F02B *31/00*
U.S. Cl. 123—75 B **15 Claims**

1. An internal combustion engine, which comprises a cylinder head, a combustion chamber in said cylinder head and having an intake port and an exhaust port, a main intake passage introducing air-fuel mixture from an air-fuel mixture producing means through said intake portion into said combustion chamber, a spark plug screwed into the cylinder head of the engine so that the spark gap rests in a given position in said

combustion chamber, an injection chamber provided in the cylinder head in close vicinity to said spark gap, the volume of said injection chamber being limited to between 0.5 cc and 1.5 cc, an injection port provided in the vicinity of said spark gap so as to connect said combustion chamber with said injection chamber, said injection port being directed toward said spark gap or its vicinity and to produce a swirl and turbulence of air-fuel mixture inducted through said intake port into said



combustion chamber, an auxiliary intake passage opening to said injection chamber, an auxiliary intake valve for opening and closing said auxiliary intake passage, and means for actuating said auxiliary intake valve, wherein air, exhaust gas or air-fuel mixture introduced by way of the auxiliary intake passage is injected through the injection port into the combustion chamber under the influence of vacuum produced in the combustion chamber during the intake stroke.

4,178,890

DECELERATION CONTROL APPARATUS FOR VEHICLE ENGINE

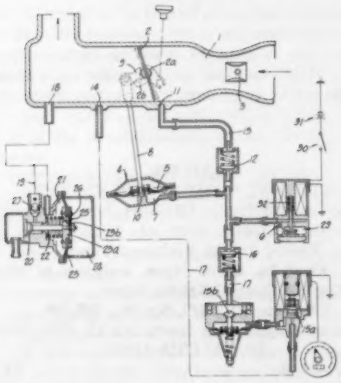
Hitoshi Yamabe, Saitama; Syoichi Otaka, Miyoshi, and Masao Watanabe, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 702,053, Jul. 2, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,841

Claims priority, application Japan, Jul. 8, 1975, 50-83129

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 R **4 Claims**



1. Deceleration control apparatus for a vehicle engine having a throttle valve mounted in an intake passage, the improvement comprising, in combination: a dash pot mechanism having a diaphragm operatively connected to said throttle valve, a vacuum chamber having a wall thereof formed by said diaphragm, a vacuum outlet positioned slightly upstream of the adjacent portion of the throttle valve at its minimum opening position, a vacuum passage connected between said vacuum chamber and said vacuum outlet, a check valve positioned in said vacuum passage opening on increased vacuum intensity in said vacuum outlet, a restricted passage connecting said vacuum chamber to atmosphere, an air passage communicating with said intake passage downstream from the throttle valve, a control valve operatively interposed in said air passage and having a movable valve element, pressure responsive means including a movable member for moving said valve element between open and closed position, said pressure responsive means including a vacuum chamber on one side of said movable member subjected to pressure in said air passage, means providing a closed chamber on the other side of said movable member, and valve means on the movable member acting to restrict flow from the closed chamber to the vacuum chamber while permitting relatively unrestricted flow in the opposite direction, whereby the control valve is opened quickly upon increase in vacuum intensity in said air passage to permit flow of atmospheric air into the engine intake passage, said control valve closing relatively slowly upon reduction of vacuum intensity in said air passage.

4,178,891

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

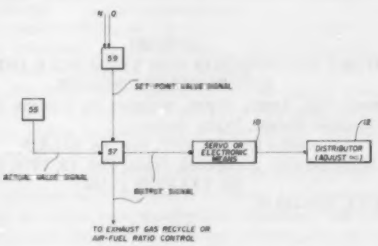
Reinhard Latsch, Vaihingenn; Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, and Reiner Burkel, Le Chesney, France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 564,073, May 27, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 665,797

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1975, 2510526

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **3 Claims**



1. A method for controlling the operation of an internal combustion engine, comprising the steps of:

(A) determining a measurement-time interval, the duration of which corresponds to an angular region of the crankshaft rotation related to at least one stroke of a piston of the engine;

(B) generating a measurement value from an engine operating parameter during the measurement-time interval, said generated measurement value varying during the measurement-time interval as a measure of the fluctuations of the angular speed of the crankshaft over said angular region, and corresponding to the average combustion chamber pressure;

(C) integrating the measurement value generated;

(D) comparing an integrated measurement value generated during a subsequent measurement-time interval and generating a differential value as an actual value of the combustion chamber's average pressure;

(E) generating a nominal value of the combustion chamber average pressure; and

(F) adjusting the ignition timing angle of the engine in accor-

dance with the difference between the nominal and actual values.

4,178,892

SPEED-DEPENDENT IGNITION TIME ADVANCEMENT APPARATUS IN MAGNETO GENERATOR IGNITION SYSTEMS

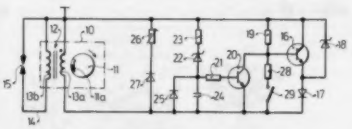
Jiri Podrapsky, Buchschwabach, and Josef Orova, Schwabach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 2, 1978, Ser. No. 874,651

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712695

Int. Cl.[2] F02P *5/04*; H03K *17/64*

U.S. Cl. 123—117 R **6 Claims**



1. In an ignition system for an internal combustion engine, said ignition system having a rotating magneto system driven by said engine and armature means including a primary winding (**13***a*) and a second winding (**13***b*) cooperating with said rotating magneto system, a spark plug connected to said secondary winding, controllable impedance means (**16**) having a controlled impedance circuit connected in series with said primary winding and having a control electrode for changing the impedance of said controlled impedance circuit in accordance with a control signal applied to said control electrode and for interrupting current flowing through said primary winding in response to an ignition timing signal applied to said control electrode, and means (**20–25**) connected to said primary winding and said control electrode for furnishing said ignition timing signal to said control electrode when the voltage across said primary winding reaches a predetermined voltage, apparatus for abruptly advancing the ignition timing when the speed of said engine exceeds a predetermined speed, comprising

bistable means (**29**; **31**) having a first and second stable state when said speed of said engine is less than and greater than said predetermined speed, respectively, connected to said control electrode for causing said controlled impedance circuit to have a greater impedance prior to the ignition time when said bistable means is in said second stable state than when said bistable means is in said first stable state, thereby advancing said ignition timing at higher engine speeds.

4,178,893

IGNITION CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Keiji Aoki, Susono, Japan, assignor to Toyota Jidoshi Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 3, 1978, Ser. No. 874,756

Claims priority, application Japan, Jul. 19, 1977, 52-08556

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 D **4 Claims**

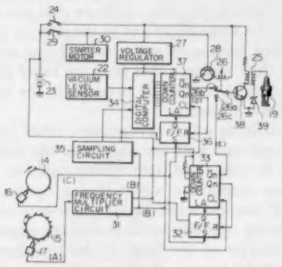
1. An ignition control apparatus for an internal combustion engine having a power supply, cylinders, and spark plugs each of which is mounted on each of said cylinders, comprising:

a signal generating means for generating electrical signals which indicate the conditions of said engine;

a first electrical circuit, which would be inoperable at low voltages from the power supply which may occur at the time of starting the engine, for calculating ignition timing of each of said spark plugs in response to the value of said electrical signals, and for generating a control signal based on said calculated ignition timing;

a second electrical circuit for generating a control signal based on ignition timing of a fixed spark-advance angle, said second electrical circuit comprising a C-MOS type electrical circuit which is operable at low voltages from the power supply which may occur at the time of starting the engine;

a third electrical circuit for controlling the timing of sparks



produced by said spark plugs in response to the value of a control signal provided from either one of said first electrical circuit and said second electrical circuit; and

a switching means which is automatically changed over and controlled for applying said control signal from said second electrical circuit to said third circuit at the time of starting said engine and for applying said control signal from said first electrical circuit to said third circuit during periods of operation of the engine other than at the time of starting the engine.

4,178,894

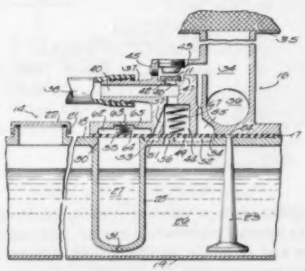
NONPOLLUTING LIQUID FUEL SYSTEM FOR ENGINES

Paul R. Nau, Wauwatosa, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Mar. 17, 1978, Ser. No. 887,476

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 B **9 Claims**



1. In a fuel system for a cyclically operating internal combustion engine that has a crankcase in which there is a subatmospheric pressure during at least a portion of each engine cycle when the engine is operating, and which system comprises a tank that holds a liquid fuel supply for the engine and wherein a substantially constant atmospheric pressure is to be maintained:

A. an imperforate removable closure for an opening in the tank through which fuel is filled thereinto, said closure, when in place, providing a substantially vapor-proof seal for the tank;

B. means defining a suction chamber which is at all times

communicated with the interior of the crankcase and which is communicable with the atmosphere through a breather passage;

C. a check valve in said breather passage arranged to normally close the same but to open when pressure in the suction chamber exceeds atmospheric pressure;

D. means defining a fuel tank pressure relief passage communicated at one end with the interior of the fuel tank and communicated at its other end with the interior of the crankcase;

E. pressure responsive outlet valve means operatively associated with said pressure relief passage, comprising a movable element having opposite surfaces that are respectively exposed to the atmosphere and to the interior of the tank, at the top thereof, said outlet valve means being normally closed to prevent flow through said pressure relief passage but being arranged to be opened by pressure in the tank that exceeds atmospheric pressure;

F. means defining a fuel tank suction relief passage communicated at one end with the interior of the tank and communicated at its other end with the atmosphere; and

G. pressure responsive valve means operatively associated with said suction relief passage, comprising a movable element having opposite surfaces that are respectively exposed to the interior of the tank, at the top thereof, and to the interior of the suction chamber, said inlet valve means being normally closed to prevent flow through said suction relief passage but being arranged to be opened by subatmospheric pressure in said suction chamber.

4,178,895

TWO STAGE VACUUM BREAK ASSEMBLY

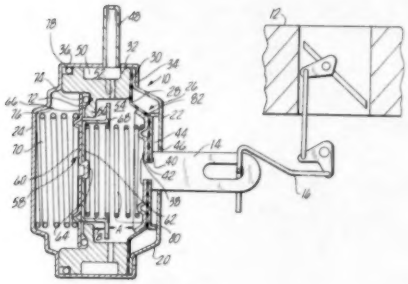
Benjamin C. Benjamin, Flint, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Apr. 17, 1978, Ser. No. 896,940

The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.

Int. Cl.[2] F02M *7/24*

U.S. Cl. 123—119 F **14 Claims**



12. In combination, a vacuum responsive device, a choke valve, and an internal combustion engine, said engine including a carburetor and an intake manifold, said carburetor including an induction passage, said choke valve in said passage, said vacuum responsive device being operatively connected to move said choke valve initially from a closed position to a partly open position in response to a predetermined vacuum in the engine intake manifold when the engine is started and subsequently after a period of delay to move said choke valve from said partially open position to a fully open position, said vacuum responsive device including a housing, a diaphragm in said housing forming a constant pressure chamber at one side, a movable wall in said housing forming a delay chamber at one side, said diaphragm and said movable wall forming a variable pressure chamber therebetween, means communicating said manifold with said variable pressure chamber, passage means between said manifold and said delay chamber, a plunger connected to said choke valve and to said diaphragm, said diaphragm being movable in a first range upon starting of said engine to establish vacuum pressure in said variable pressure chamber to engage said movable wall, said diaphragm and wall being movable as a unit in a second stage upon establishing vacuum pressure in said delay chamber through said passage means.

4,178,896

EXHAUST GAS RECYCLING SYSTEM

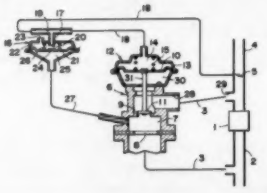
Masafumi Horikoshi, Toyota; Hidetaka Nohira, Mishima, and Masaaki Tanaka, Susono, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 757,834, Jan. 10, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,119

Claims priority, application Japan, Sep. 10, 1976, 51-109098

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **10 Claims**



1. An exhaust gas recycling system combined with an internal combustion engine having an air intake and exhaust manifold comprising:

exhaust regulating means coupled to said air intake and exhaust manifold for restricting the amount of exhaust gas recycled from said exhaust manifold to said air intake manifold and for controlling a ratio of recycled exhaust gas to air intake volume, said exhaust regulating means further including a valve means for restricting the amount of recycled gas when the air intake of said internal combustion engine increases above a predetermined magnitude such that the ratio of the amount of recycled exhaust gas to air intake volume decreases as the amount of air flow continues to increase after said valve is fully opened; and

control means coupled to said exhaust regulating means communicating with at least one of said air intake and exhaust manifolds for controlling said exhaust regulating means.

4,178,897

SYSTEM AND METHOD OF FEEDING GASOLINE FUEL INTO AN INTERNAL COMBUSTION ENGINE

Robert C. Strem; R. C. Strem, both of New Castle, and John H. Eberle, Colfax, all of Calif., assignors to Omnewtronics, Inc., Reno, Nev.

Filed Oct. 20, 1977, Ser. No. 843,799

Int. Cl.[2] F02M *7/18*

U.S. Cl. 123—122 E **2 Claims**

2. A system for feeding gasoline fuel into a gasoline burning internal combustion engine which includes a carburetor and an intake manifold and which, when operating draws a vacuum through said manifold, the level of said vacuum being inversely proportionate to the power developed by the engine, said system comprising:

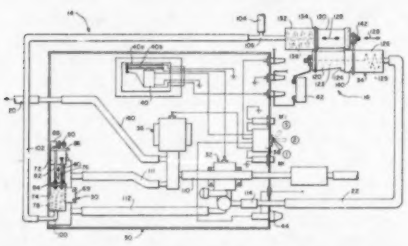
(a) a liquid gasoline collection area;

(b) first supply line means for supplying gasoline in a liquid state to said first collection area;

(c) a liquid gasoline vaporization chamber;

(d) second supply line means for directing the liquid gasoline passing out of said liquid gasoline collection area to said vaporization chamber;

(e) means located within said vaporization chamber for vaporizing the liquid gas therein;
(f) means connected with said intake manifold and responsive to the vacuum level thereat for
(i) automatically varying the liquid gasoline passing out of said collection area in an amount which is inversely proportional to the vacuum level at said manifold, and
(ii) automatically directing the vaporized gasoline into said intake manifold in an amount which is inversely proportional to said vacuum level;
(g) a first valve means located in one of said supply lines means for opening and closing the latter;
(h) a third supply line means for supplying liquid gasoline from said supply tank to said carburetor, said third line



means bypassing said collection area and said vaporization chamber, whereby said gasoline enters said engine without first being vaporized;
(i) a second valve means located in said third supply line means for opening and closing said third line means; and
(j) means for alternatively
(i) actuating said first valve means to open said first and second supply line means, while maintaining said second valve means deactuated to maintain said third line means closed, and
(ii) actuating said second valve means for opening said third supply line means while maintaining said first valve means deactuated to maintain the first and second lines closed.

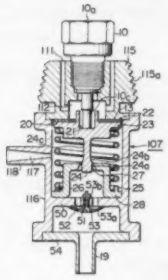
4,178,898

THERMOSTATIC VALVE FOR INTAKE AIR TEMPERATURE COMPENSATION FOR INTERNAL COMBUSTION ENGINE

Hajime Akado, Anjo; Yoshiro Uchida, Toyota; Kenichi Kubota, Kariya; Toshiharu Hasebe, Kariya; Akihide Yamaguchi, Kariya; Tsutomu Tomita, Okazaki; Suminobu Ootsubo, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Jul. 3, 1978, Ser. No. 921,566
Claims priority, application Japan, Jul. 21, 1977, 52-98059[U]
Int. Cl.[2] F02M *31/00*; G05D *23/00*
U.S. Cl. 123—122 D **5 Claims**

1. A thermostatic valve for making intake air temperature compensation for an internal combustion engine by sensing a temperature increase in the intake air being supplied to the engine and, when necessary, directly supplying an additional amount of air to the intake manifold space downstream of the throttle valve in the carburetor of the engine, to make up for any deficiency of the intake air for the engine while, at the same time, controlling, according to the temperature change of the intake air, the introduction of a negative pressure from the intake manifold into a negative pressure motor which adjusts the temperature of the intake air being supplied to the carburetor, said valve comprising a temperature sensor including a piston rod to be actuated by a thermally expandable element whose volume increases or decreases with a temperature change of said intake air, a first opening leading to the atmosphere, a second opening leading to said negative pressure motor, a third opening leading to said intake manifold, a housing formed with said first to third openings and adapted to support said temperature sensor, a partition member disposed in said housing to provide partitions between said first and third openings and between said second and third openings, said partition member being formed with holes, a valve element so located in said housing as to be actuated by said piston rod of said temperature sensor, a valve seat provided in said housing to be in and out of contact with said valve element, and a check valve installed between said partition member and said third opening to open in one direction only, said housing being formed therein with a first passageway connecting said second and third openings through the holes of said partition member, a second passageway connecting said first and second



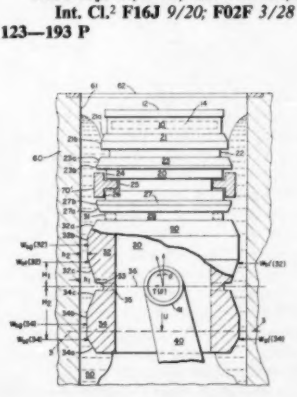
passageways, and a third passageway connecting said first and third openings through said holes of said partition member, said first passageway being opened when the negative pressure in said intake manifold acting upon said check valve is high enough to open said valve and closed when the negative pressure acting upon said check valve becomes lower than the negative pressure in said second opening and closes said check valve, said second and third passageways being opened and closed by said valve element, in such a manner that, when the intake air temperature is low, said valve element is in contact with said valve seat, thus closing said second and third passageways and, when the temperature increases, said valve element moves away from said valve seat to open said second and third passageways.

4,178,899

LOW-FRICTION PISTON

Harry Julich, 6807 Winter La., Annandale, Va. 22003

Filed Sep. 20, 1978, Ser. No. 944,132
Int. Cl.[2] F16J *9/20*; F02F *3/28*
U.S. Cl. 123—193 P **14 Claims**



1. A piston for minimizing friction and substantially eliminating abrasion, said piston being received in a bore defined by a generally cylindrical cylinder wall, and said piston including

surface means for responding to hydrodynamic reactions within said bore for maintaining said entire piston at all times at a minimum distance from said cylindrical wall to substantially entirely eliminate abrasive friction during relative motion of said piston within said bore, said piston carrying at least one expansible sealing ring for sealing against oil-pumping and gas-leakage as a function of pressure differential across said piston, said sealing ring being at at all times out of contact with said cylinder wall, and said hydrodynamic surface reaction means is formed by at least said sealing ring

6. A piston for minimizing friction and substantially eliminating abrasion, said piston including ring means being received in a bore defined by a generally cylindrical cylinder wall, and said piston including means for responding to hydrodynamic reactions comprising at least two hydrodynamic reaction surface means within said bore for maintaining said entire piston and ring means at all times at a minimum distance from said cylindrical wall to substantially entirely eliminate abrasive friction during relative motion of said piston within said bore.

4,178,900

ROTARY INTERNAL COMBUSTION ENGINE

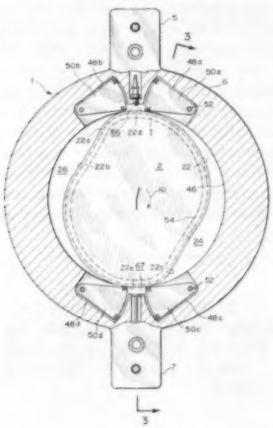
Dallas J. Larson, 2001 S. 2300 East, Salt Lake City, Utah 84108

Continuation-in-part of Ser. No. 713,942, Aug. 12, 1976, Pat. No. 4,033,300, which is a continuation-in-part of Ser. No. 633,346, Nov. 19, 1975, Pat. No. 3,986,483. This application Apr. 20, 1977, Ser. No. 789,054

The portion of the term of this patent subsequent to Oct. 19, 1993, has been disclaimed.

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—244 **19 Claims**



1. A rotary engine comprising:

a generally annular stator member having side walls and an interior peripheral wall and a first and second pair of spaced apart sockets located in the interior peripheral wall,

a first and second pair of wedges each pivotally mounted at one of their vertices on the interior peripheral wall of the stator member to pivot in and out of respective ones of said sockets as said rotor member rotates within the stator member, said wedges being mounted relative to said stator member such that a base of each wedge pivots along an arc generally towards the center of the stator member, and such that each of said bases of the wedges in each pair face each other so that a space is formed by said bases of each pair of wedges,

a rotor member having an exterior periphery and two exterior side walls and a shaft extending from one side wall thereof and mounted to rotate within said stator member, said rotor member formed to define combustion and compression cavities between the portions of the interior peripheral wall of the stator member between the bases of the wedges and the exterior periphery of the rotor member, said combustion and compression cavities being disposed substantially 180° apart about the interior peripheral wall of the stator member, said exterior periphery having two outermost portions thereof substantially parallel to the interior peripheral wall of the stator member, said portions extending at least the distance between the bases of the wedges of each pair thereof, and said portions being disposed substantially 180° apart, said portions of the exterior periphery being joined tangentially by two curved portions thereof which each first curves convexly and inwardly away from the stator member and then curves concavely and outwardly toward the stator member,

a cam track defined in at least one side wall of said rotor member,

cam followers extending from at least one portion of each wedge and guided by said cam track to cause said wedges to pivot in and out of said sockets and to maintain sliding contact with the exterior periphery of said rotor member,

means for introducing a fuel mixture into the spaces between each pair of wedges,

means for igniting the fuel mixture between each pair of wedges,

means for timing the ignition of the fuel mixture to selectively coincide with or slightly precede the time the said portions of the rotor periphery are each disposed substantially entirely across the spaces defined between each pair of wedges, and

means for exhausting the combustion products from the spaces between each pair of wedges.

4,178,901

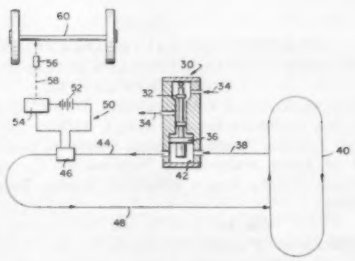
DIESEL TRUCK ROAD SPEED CONTROL

Paul B. Cunningham, 607 Orchard Hill Dr., Pittsburgh, Pa. 15238

Filed Feb. 7, 1978, Ser. No. 875,887

Int. Cl.[2] F02B *77/08*

U.S. Cl. 123—198 D **3 Claims**



1. An improved engine shut-down control valve for providing road speed supervision of a diesel truck, said control valve being of the type wherein fuel for powering said truck engine flows through an internal valve opening therein that is normally spring-biased closed except as a piston therein is biased by the oil pressure of said truck engine through movement towards said internal valve opening for maintaining the same in an open condition, the improvements for effectively obtaining road speed supervision of said diesel truck by said shut-down control valve comprising a conduit operatively connected to provide an escape passage from said control valve for said oil pressure therein incident to causing the shut-down operation of said control valve upon the escape of said oil pressure therefrom, a normally closed valve in said conduit for normally maintaining closed said escape passage thereof, and a truck road speed-sensing control operatively connected to open said normally closed valve when said truck is travelling in excess of

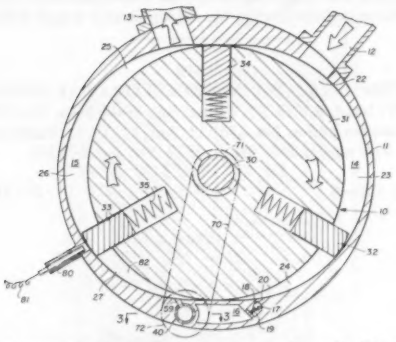
a selected speed, whereby an artificially induced condition of loss of oil pressure is made responsive to said truck road speed so as to advantageously impose an upper limit on the road speed operation of said diesel truck.

4,178,902

ROTARY ENGINE

Thomas Ganley, 46-08 195th St., Flushing, N.Y. 11358

Filed Nov. 24, 1975, Ser. No. 634,843
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—231 **8 Claims**



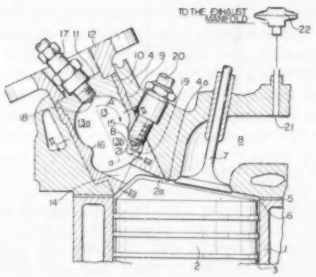
1. A rotary engine comprising a generally cylindrical rotor housing, a generally cylindrical rotor mounted for rotation within said rotor housing about the central axis thereof, a first chamber formed between said rotor and said rotor housing for compressing a combustible fluid or gas supplied thereto, a second chamber formed between said rotor housing and said rotor for expanding the combustible gas compressed in said first chamber, said rotor housing having a third chamber formed entirely within the wall of said rotor housing between said first and second chambers and extending along the axial length thereof, inlet channel extending through said wall directly connecting said first chamber with said third chamber for the passage of compressed media, one way valve means in said inlet channel permitting communication from said first to thid chamber only, and an outlet channel axially offset from said inlet channel and directly connecting said third chamber with said second chamber, and feed means located in said outlet channel for permitting a portion of the gas collected in said third chamber to exit into said second chamber in timed relationship with the rotation of said rotor, said feed means comprising a rotatable hollow pin having a plurality of radial openings formed in the circumference thereof arranged in a plurality of series each series lying along a straight line on said circumference of said pin, each series having at least one first opening aligned with the third chamber and at least one second opening aligned with the outlet channel, whereby as each opening aligns respectively with the chamber and channel, the gas or fluid in said third chamber enters said pin through said first openings and collects therein and subsequently exits through said second openings of each series when said openings are in alignment with the respective channel, means for supplying the combustible gas or fluid to said first chamber, means for removing the gas or fluid from second chamber, said second chamber having igniting means mounted therein for igniting the compressed gas fed thereby by said third chamber, and a drive shaft connected to the center of said rotor for rotation therewith, whereby the gas compressed in said first chamber is forced into said third chamber and fed to said second chamber via said hollow pin for ignition therein to thereby drive said rotor and drive shaft.

4,178,903

INTERNAL COMBUSTION ENGINE WITH AN AUXILIARY COMBUSTION CHAMBER

Hiromichi Yanagihara, and Nobuhiro Miura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 7, 1977, Ser. No. 849,355
Claims priority, application Japan, Aug. 17, 1977, 52/97876
The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.
Int. Cl.[2] F02B *3/00, 33/02*
U.S. Cl. 123—32 SP **6 Claims**



1. An internal combustion engine provided with an intake passage having no throttle valve therein, said engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head having a cavity therein and mounted on said cylinder block, said cavity having an inner wall which defines an auxiliary chamber with an axis;

a piston reciprocally movable in said cylinder bore, said piston and said cylinder head forming a main chamber therebetween;

an intake valve movably mounted on said cylinder head for leading air into said main chamber via the intake passage;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a raised portion formed on the inner wall of said auxiliary chamber and defining a restricted opening, said raised portion dividing said auxiliary chamber into a first chamber and a second chamber which are arranged in tandem along the axis of said auxiliary chamber and forming a recess in said second chamber beneath said raised portion;

a connecting passage formed in said cylinder head and communicating said main chamber with said auxiliary chamber, said connecting passage being arranged to be tangentially connected to the inner wall of said second chamber for creating a swirl motion of the air at the time of the compression stroke, the sum of the volumes of said auxiliary chamber and the connecting passage being more than 80 percent of the sum of the volumes of the auxiliary chamber, the connecting passage and said main chamber when said piston reaches the top dead center position;

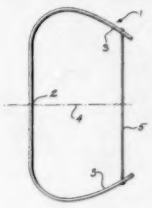
means for recirculating a large amount of the exhaust gas into the intake passage;

fuel injecting means having an injecting nozzle disposed in the first chamber of said auxiliary chamber and directed to said recess located opposite to the inner wall to which said connecting passage is tangentially connected with respect to the axis of said auxiliary chamber for forming a combustible mixture having the total air-fuel ratio which is increased within the range of 30 through 100:1 in accordance with a decrease in the level of the load of the engine; and

ignition means having a spark plug with a spark gap located in said recess for advancing the ignition timing within the range of 15 through 50 degrees before the top dead center

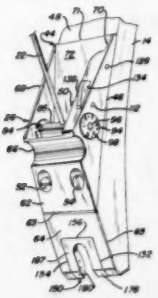
position in accordance with a decrease in the level of the load of the engine.

4,178,904
ARCHERY BOW
Karl Meininger, P.O. Box 391, Sheboygan, Wis. 53081
Filed Nov. 19, 1976, Ser. No. 743,329
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—23 R **1 Claim**



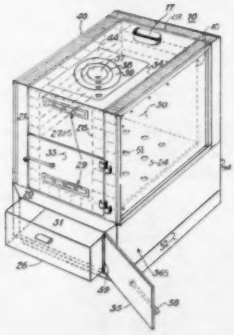
1. An archery bow comprising, in combination:
(a) a frame comprising an elongated straight central portion having limbs extending from the ends thereof and with said frame defining an axis of draw for an arrow,
(b) said limbs being integral with the frame and terminating in end portions which are normally disposed at an angle of less than 90° from the inner face of said central portion and with said end portions facing toward the axis of draw of the bow,
(c) and a free straight draw string connected between the terminal end portions of said limbs,
(d) said draw string being substantially coplanar with the plane formed by the frame and the limbs, said string being parallel to the said straight central portion of said frame and being the same length as said central portion, the construction being such that during an arrow projecting operation said string is drawn toward said straight central portion by one hand of a user while the other hand of the user holds the control portion in front of the user's body.

4,178,905
COMPOUND BOW ADJUSTMENT AND INDICATING MECHANISM
Norman A. Groner, Kalkaska, Mich., assignor to Victor United, Inc., Chicago, Ill.
Division of Ser. No. 619,370, Nov. 10, 1975, Pat. No. 4,061,124.
This application Aug. 31, 1977, Ser. No. 829,488
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—23 R **9 Claims**



1. A compound archery bow comprising, an elongated handle portion having a longitudinal axis, a pair of limb portions attached to opposite ends of said handle portion, cable means attached to the bow for propelling an arrow from the bow, wheel means fixedly journaled adjacent the outer end portions of said limb portions for rotatably supporting said cable means for propelling an arrow from the bow, cable attachment means fixedly mounted adjacent the juncture of each said limb portion and handle portion, at least one flange portion on each of said attachment means and having an outer side wall, rotatable shaft means transversely journaled through each said attachment means flange portion and engaging said cable means, said shaft means displaceable to vary the tension upon said cable means to change the draw length of said bow, tool receiving means on one end of said shaft means exposed for access outside said flange portion outer side wall to permit rotary displacement of said shaft means, indicia means on said cable attachment means viewable outside said flange portion outer side wall to signify uniform draw length positions for each said shaft means, and indicia means on said wheel means for signifying uniform rotation during the timing of said wheel means.

4,178,906
KITCHEN COUNTERTOP WOOD OR COAL STOVE
Lloyd W. Lund, R.F.D. #2, Chapel Rd., Waldoboro, Me. 04572
Continuation of Ser. No. 676,113, Apr. 12, 1976, abandoned.
This application Nov. 9, 1977, Ser. No. 849,949
Int. Cl.[2] F24C *1/14*
U.S. Cl. 126—6 **10 Claims**



1. A solid fuel stove of a size to operatively fit alongside a kitchen counter unit, in which said stove is formed with a combustion chamber lined on its sides and rear by a lining and bounded externally by insulating side wall assemblies and an insulating rear wall assembly,
wherein said side and rear wall assemblies are formed of an exterior imperforate panel spaced from said lining by baffles, with a continuous series of vents extending along the front face and top face of each side wall assembly opening to the interior of said side wall assemblies.

4,178,907
UNIFIED HOT WATER AND FORCED AIR HEATING SYSTEM
James R. Sweat, Jr., 2284 Heritage Dr., San Jose, Calif. 95124
Filed Jul. 27, 1978, Ser. No. 928,366
Int. Cl.[2] F24D *9/00*; F24H *1/22*
U.S. Cl. 126—101 **12 Claims**

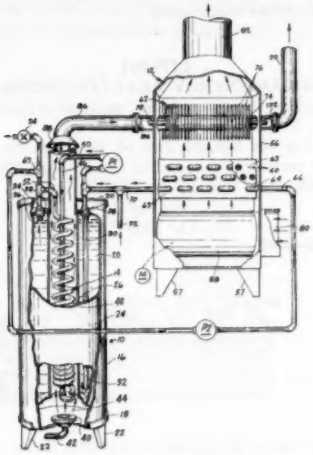
6. A forced air heating system comprising:
a gas-to-liquid heat exchange unit disposed within an exhaust flue of a water heater of the type having an inflow port, an outflow port and a hot gas exhaust flue, said heat exchange unit having a water inflow end and a water outflow end, said water outflow end being coupled to said water heater outflow port, whereby water flowing through said gas-to-liquid heat exchange unit is heated by hot gas within said flue;
a forced air heater including
a casing means having an inflow duct and an outflow duct and defining an air chamber,

a liquid-to-gas heat exchange unit disposed within said chamber and having a water inflow end and a water outflow end,

a gas-to-gas heat exchange unit disposed within said chamber and having a gas inflow end and a gas outflow end, and

blower means for moving air through said inflow duct into said chamber, past said liquid-to-gas heat exchange unit and said gas-to-gas heat exchange unit and out said outflow duct;

a first pump means coupling said inflow port to said first water inflow end to pump water into said first water inflow end;



a second pump means coupling said outflow port to said second water inflow end to pump water into said second water inflow end;

means coupling both said inflow port and said second water outflow end to a source of pressurized water; and

means connecting the terminal end of said exhaust flue to said gas inflow end;

whereby said air flowing through said chamber and out said outflow duct is heated by the hot water flowing through said liquid-to-gas heat exchange unit from said water heater and by the hot gases flowing through said gas-to-gas heat exchange unit from said exhaust flue and whereby hot water is always present at said outflow port due to the rapid heating of the water within said gas-to-liquid heat exchange unit.

4,178,908

FIREPLACE HEATING UNIT

Charles H. Trexler, Sr., 6229 Debora Dr., Richmond, Va. 23225

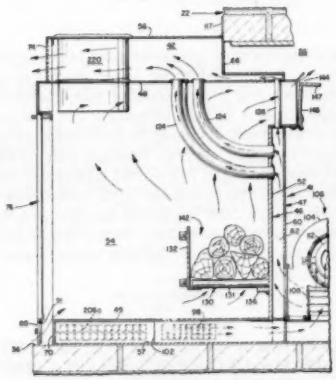
Filed Oct. 5, 1978, Ser. No. 948,785

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **17 Claims**

1. A fireplace heating unit adapted to be supported on the hearth and fireplace floor of an existing fireplace to extend into the existing fireplace recess, comprising a housing structure having (a) a metal furnace jacket defining a combustion chamber for receiving a fuel to be burned and (b) metal housing means receiving said jacket, said housing means and said furnace jacket having spaced apart wall portions to provide an interior air space between said furnace jacket and said housing means, wall means forming a part of said housing structure and partitioning said interior space into a plenum and an air conduction space, said plenum overlying said furnace jacket and combustion chamber, and said air conduction space extending at least along the back of the furnace jacket, conduit means exposed in said combustion chamber and establishing fluid communication between said air conduction space and said plenum to provide for the flow of air from said conduction space to said plenum without mixing with combustion gases in said combustion chamber, a forced air blower connected to feed air to be heated to said air conduction space for flow through said air conduction space and said conduit means to said plenum, the air flowing through said air conduction space and said conduit means being heated by the fire produced by the burning of fuel in said combustion chamber whereby heated air is delivered to said plenum, said plenum having an air outlet opening to provide for the passage of the heated air from said plenum to the room area being heated, said housing structure being adapted to seat on the fireplace floor and said hearth at a location where only a rearward portion of said housing structure is received in said fireplace recess, at least a portion of said plenum and a portion of the combustion chamber vertically underlying said plenum being disposed forwardly of said rearward portion to be positioned forwardly of said fireplace recess when said rearward portion is received in said recess, and at least one upwardly opening water-receiving receptacle mounted in housing structure, said receptacle having its open upper end disposed at the top wall of said plenum at a location where it is disposed forwardly of said fireplace recess to open into the room area being heated, said receptacle extending at least in said plenum and being exposed to the heat produced by burning fuel in said combustion chamber to provide for the vaporization of water in said receptacle.

2. A fireplace heating unit adapted to be supported on the hearth and fireplace floor of an existing fireplace to extend into



the existing fireplace recess, comprising a housing structure having (a) a metal furnace jacket defining a combustion chamber for receiving a fuel to be burned and (b) metal housing means receiving said jacket, said housing means and said furnace jacket having spaced apart wall portions to provide an interior air space between said furnace jacket and said housing means, wall means forming a part of said housing structure and partitioning said interior space into a plenum and an air conduction space, said plenum overlying said furnace jacket and combustion chamber, and said air conduction space extending at least along the back of the furnace jacket, said housing structure further defining a combustion gas outlet at a rearward region of said combustion chamber to provide for the exhaust of hot combustion gases from said combustion chamber, an array of air conveying tubes exposed in said combustion chamber and establishing fluid communication between said air conduction space and said plenum to provide for the flow of air from said conduction space to said plenum without mixing with combustion gases in said combustion chamber, said tubes being disposed in a region lying between said combustion gas outlet and the fuel in said combustion chamber such that the hot combustion gases pass around said tubes before exiting through said combustion gas outlet, said tubes providing the only fluid communication between said plenum and said air conduction space, and a forced air blower connected to feed air to be heated to said air conduction space for

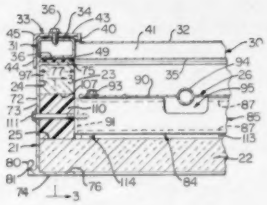
flow through said air conduction space and said tubes to said plenum, the air flowing through said air conduction space and said tubes being heated by the fire produced by the burning of fuel in said combustion chamber whereby heated air is delivered to said plenum, and said plenum having an air outlet opening to provide for the passage of the heated air from said plenum to the room area being heated.

4,178,909

SOLAR COLLECTOR

Patrick F. Goolsby, Richmond, Va.; David J. Laudig, Palos Verdes, Calif.; Paul A. Mechler, La Palma, Calif.; Steven J. Osterhus, Westminster, Calif., and George F. Swenck, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 1, 1978, Ser. No. 901,300
Int. Cl.[2] F24J *3/02*; E04B *1/00*
U.S. Cl. 126—417 **17 Claims**



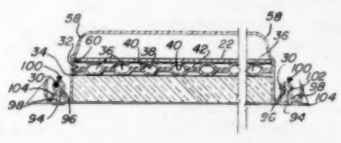
1. In a solar collector having a cover assembly comprising a structural frame, a flexible polymeric cover sheet disposed on said structural frame and a top retaining frame sandwiching peripheral edge portions of said polymeric cover sheet, the improvement wherein said retaining frame comprises at least one substantially L-shaped member having a pair of legs extending from a common bight, one of said legs of said member having a projecting lip that extends generally parallel to and in the same direction as the other leg or said member and engages said cover sheet to provide stretching thereof and to maintain said cover sheet taut under various ambient temperature conditions.

4,178,910

SOLAR COLLECTOR AND SYSTEM FOR MOUNTING A PLURALITY OF SOLAR COLLECTORS ON A SURFACE

Eben J. Gramer, 5441 E. Nassau Cir., Englewood, Colo. 80110, and Melvin O. Johnson, 6488 Southwood Dr., Littleton, Colo. 80121

Continuation-in-part of Ser. No. 700,040, Jun. 25, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 814,030
Int. Cl.[2] F24J *3/02*; F16M *13/00*; F16L *21/02*; F16J *15/10*
U.S. Cl. 126—442 **12 Claims**



1. A solar energy collecting system adapted to be mounted on a supporting surface comprising:

a plurality of individual solar collector units, each of said units having a base sheet member having flange members extending along opposite sides thereof, wherein each of said base sheet members has a substantially planar main portion from which said flange members extend upwardly at an angle,

mounting rails extending in parallel relationship along said supporting surface between adjacent units, each of said mounting rails includes a bead member having a symmetrical cross-sectional width greater than the portion of the rail immediately below said bead member extending along an upper edge thereof, and

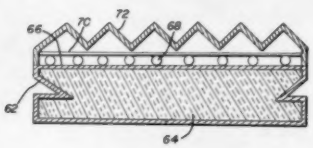
clip means for maintaining the upwardly extending flanges of said units against said mounting rails, said clip means extending over at least a portion of said mounting rails and a portion of said flange units to integrate the units into a solar energy collecting system, said clip means being sufficiently resilient to snap onto said bead members, said flange members abutting a lower portion of the bead members of the respective mounting rails when said solar energy system is assembled.

4,178,911

SOLAR ENERGY HEAT COLLECTOR

John P. Mattson, Duxbury, Mass., assignor to Solarspan, Inc., Duxbury, Mass.

Division of Ser. No. 649,032, Jan. 14, 1976, Pat. No. 4,077,393, which is a continuation-in-part of Ser. No. 621,759, Oct. 14, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,822
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—449 **2 Claims**



1. A solar energy collector comprising a cover means comprising a surface having a plurality of spaced raised portions, said spaced raised portions having surfaces angularly disposed to said cover surface to transmit radiant solar energy to an energy receiving means for converting radient solar energy to thermal energy, said energy receiving means comprising an integral structure having a top surface and side surfaces, insulation means disposed within said top and side surfaces and forming the base of said collector, said top surface comprising the energy receiving surface, said energy receiving surface having a plurality of channels extending along said top surface for controlling the flow of a heat exchange fluid over said top surface and provide for exchange of heat from said energy receiving surface to said heat exchange fluid, means for introducing a heat exchange fluid to said energy receiving surface, means for collecting said heat exchange fluid after contact with said energy receiving surface, other channel means carried by each of said side surfaces, means for attaching to a supporting surface and having a configuration to removably engage said other channel means, and means for holding said cover means in spaced relationship to said energy receiving means.

4,178,912

SOLAR HEATING SYSTEM

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

Filed Aug. 9, 1977, Ser. No. 823,088
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—452 **27 Claims**

1. Method for providing solar heating over the entire area of an upwardly facing roof structure and for providing a roof over the entire area of such roof structure, said roof structure having plural parallel spaced rafters sloping downwardly over its entire area, comprising

installing solar heating assemblies on said rafters to bridge across the spaces between adjacent of said rafters over the entire area of said roof structure,

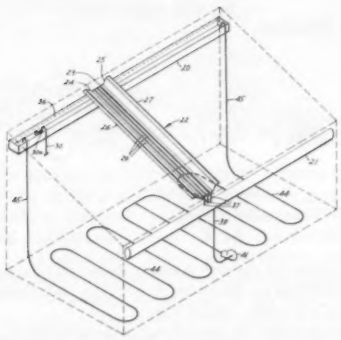
each said solar heating assembly having means along each of its opposite sides adapted for connection to a rafter along

each side thereof whereby said solar heating assemblies may be assembled on said rafters,

each said solar heating assembly having fluid inlet means at its upper end and having fluid outlet means at its lower end and having flow conduit means therebetween for use in absorbing heat resulting from solar radiation,

providing a circulating fluid reservoir adjacent the upper ends of said solar heating assemblies along the upper edge of said roof structure and exposing circulating fluid therein to atmospheric pressure,

disposing the ends of said fluid inlet means to be immersed in the circulating fluid in said reservoir so that circulating fluid may be drawn through said fluid inlet means from said reservoir into said flow conduit means by syphoning action,



providing a flow manifold connecting all of said fluid outlet means of said solar heating assemblies along the lower edge of said roof structure,

connecting said flow manifold and said reservoir to heat extracting means for circulating fluid through said conduits between said flow inlet and outlet means and for utilizing heat extracted from said fluid,

and providing sheathing means bridging across said spaces between said rafters and providing a roof over said solar heating assemblies over the entire area of said roof structure,

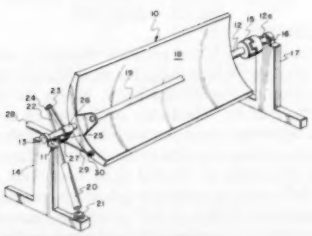
said method providing solar heat collection over the entire area of said roof structure and providing a roof over the entire area of said roof structure.

4,178,913

SOLAR COLLECTOR SYSTEM

J. A. Hutchison, Dallas, Tex., assignor to Solar Kinetics, Inc., Dallas, Tex.

Filed Dec. 23, 1977, Ser. No. 864,089
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—424 **11 Claims**



1. A solar collector system comprising:

(a) a moveable solar collector surface;

(b) rotation axle means supporting said solar collector surface;

(c) support means for supporting said rotation axis means whereby said rotation axle means can be rotated about the axis of said rotation axle means;

(d) a primary piston and cylinder means operably connected to said support means;

(e) a rotation collar means, rotatably supported by said support means;

(f) means for operably connecting said rotation collar means to said primary piston and cylinder means whereby movement of said primary piston within said primary cylinder causes rotation of said rotation collar;

(g) a secondary piston and cylinder means operably supported by said rotation collar;

(h) means for operably connecting said secondary piston and cylinder means to said solar collector surface whereby movement of said secondary piston within said secondary cylinder causes movement of said solar collector surface;

(i) means for selectively adding and removing hydraulic fluid to and from said primary cylinder to cause said primary piston to move within said primary cylinder; and

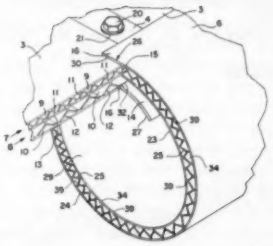
(j) means for selectively adding and removing hydraulic fluid to and from said secondary cylinder to cause said secondary piston to move within said secondary cylinder.

4,178,914

HEADER FOR A SOLAR ENERGY COLLECTION SYSTEM

Robert A. Erb, Valley Forge, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

Continuation-in-part of Ser. No. 645,648, Dec. 31, 1975, Pat. No. 4,114,597. This application Aug. 3, 1978, Ser. No. 930,797
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—449 **35 Claims**



7. In a solar thermal energy collection system comprising at least one solar collector panel, capable of being affixed to a structure, the collector panel having an upper, heat insulating region comprising first channels longitudinally extending therethrough which contain a first fluid therein, and a lower, heat absorbing region comprising second channels longitudinally extending therethrough which contain a second fluid therein, and at least one header, connected to the collector panel along an interface abutting the first and second channels, and connecting the collector panel to the remainder of the energy collection system, an improved header which comprises:

an inner and an outer wall, separating the interior cavity defined by the header from the exterior of the header, and

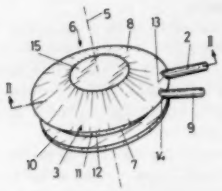
a plurality of ribs, connected between the inner and outer wall, which separate the inner and outer wall from each other.

4,178,915

SELECTIVELY OPERATABLE BLOCKING DEVICE FOR TUBULAR BODY ORGANS

Gerhard Szinicz, and Werner Trawöger, both of Innsbruck, Austria (6020)

Filed Aug. 16, 1977, Ser. No. 825,104
Int. Cl.[2] A61F *1/00*; A61B *17/00*
U.S. Cl. 128—1 R **22 Claims**



1. A closure device for the selective blocking and unblocking of a tubular body organ, said device comprising:

a sleeve surrounding said body organ within the body of a subject, said sleeve being formed with an expandable compartment;

a connecting duct communicating with said compartment and disposed within the body of said subject;

a variable-volume supply vessel containing a pressure medium and communicating with said sleeve, said vessel being disposed within the body of said subject and being actuatable between a compressed state and an expanded state, said vessel being formed from a pair of shells sealingly interconnected along their edges;

means within said vessel for releasably retaining said vessel in said compressed state; and

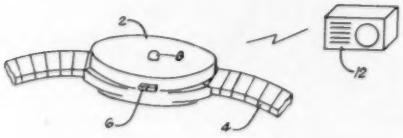
restoring means in said vessel for biasing same into said expanded state.

4,178,916

DIABETIC INSULIN ALARM SYSTEM

Elger W. McNamara, 5520 W. Camino Cielo, Santa Barbara, Calif. 93105

Filed Sep. 26, 1977, Ser. No. 836,250
Int. Cl.[2] A16B *5/4*
U.S. Cl. 128—734 **9 Claims**



1. A diabetic shock alarm system designed to be worn on a person's wrist and to monitor the wearer's body temperature and skin resistance, signalling to the wearer the onset of diabetic shock, the system including:

Means to sense the body temperature of the wearer and to produce an electrical output,

Means to sense the skin resistance of the wearer and to produce an electrical output,

Pulse generator means actuated by an abnormal output of both the body temperature sensor means and the skin resistance sensor means to generate pulses only in response to an abnormal output of said sensor means,

Oscillator means actuated by pulses of a given polarity produced by the pulse generator,

A tuned circuit directly connected to both the pulse generator means and the oscillator means to be energized by both the pulses produced by the pulse generator and oscillations produced by the oscillator means, and

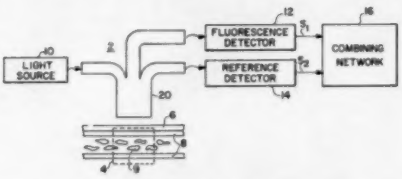
Antenna means connected to the tuned circuit to radiate electromagnetic energy at a frequency of an electromagnetic receiver, whereby the wearer may tune the electromagnetic receiver to the frequency of the tuned circuit, the system then alerting the wearer of the onset of diabetic shock through the electromagnetic receiver.

4,178,917

METHOD AND SYSTEM FOR NON-INVASIVE DETECTION OF ZINC PROTOPORPHYRIN IN ERYTHROCYTES

Howard M. Shapiro, 283 Highland Ave., West Newton, Mass. 02165

Filed Jan. 3, 1979, Ser. No. 866,788
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—665 **21 Claims**



1. A system for the non-invasive detection of zinc protoporphyrin (ZPP) in erythrocytes in a region underlying a sample surface of a patient, comprising:

A. source means for generating excitation light in a predetermined spectrum, said predetermined spectrum being outside the characteristic fluorescence emission spectrum of ZPP and at least a portion of said predetermined spectrum being in the characteristic fluorescence excitation spectrum of ZPP,

B. first detection means for generating a first signal representative of the intensity of light incident thereon and in said characteristic fluorescence emission spectrum of ZPP,

C. second detection means for generating a second signal representative of the intensity of light incident thereon and within said predetermined spectrum,

D. transfer means for directing said excitation light to be incident on said sample surface, and for directing light emitted from said sample surface to be incident on said first and second detection means,

E. circuit means responsive to said first and second signals to generate a signal representative of the concentration of ZPP in said erythrocytes.

4,178,918

AUTOMATIC BLOOD PRESSURE MEASURING AND RECORDING SYSTEM

Lionel B. Cornwell, 52 Madison Springs Dr., Madison, Conn. 06443

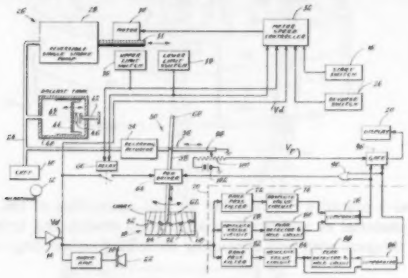
Filed Sep. 15, 1977, Ser. No. 833,608
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—682 **10 Claims**

1. In a noninvasive blood pressure measuring and recording system of the type which includes an inflatable cuff forencircling a portion of the human body, means for inflating and deflating the cuff for selectively occluding an arterial vessel, means for detecting flow variations through the artery and means for recording the arm cuff pressure values corresponding to the detection of desired flow variations through the artery as cuff pressure is decreased, the improvement therein enabling reproducibility of cuff pressure decrease and controlled variability of constant rates of pressure decrease which comprises:

the means for inflating and deflating the cuff comprising a

single stroke reversible pump having a piston, a cylinder and a flexible sleeve diaphragm, the piston being movable within the cylinder and joined thereto through the flexible sleeve diaphragm, the diaphragm being arranged to fit in a folded position between the cylinder and piston and to maintain a pressure seal therebetween, the piston, cylinder and diaphragm forming a variable volume, contained air chamber pneumatically coupled to the cuff,

controllable motor means operable at a preselected constant



speed for moving the piston within the cylinder to vary the volume of the contained air chamber in a predetermined fashion, thereby to produce a corresponding predetermined and precise pressure variation in the inflatable cuff for accurate blood pressure measurements, and

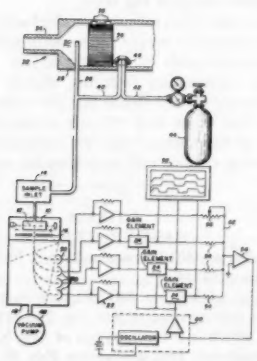
control means for controlling the motor means during decrease of cuff pressure in response to the flow variation detection means to operate the motor means at a different preselected constant speed following initial detection of flow variations in the arterial vessel.

4,178,919

FLOWMETER FOR PROVIDING SYNCHRONIZED FLOW DATA AND RESPIRATORY GAS SAMPLES TO A MEDICAL MASS SPECTROMETER

Lawrence G. Hall, Creve Coeur, Mo., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 3, 1978, Ser. No. 893,033
Int. Cl.[2] A61B *5/08*
U.S. Cl. 128—719 **6 Claims**



1. A flowmeter for providing synchronized gas flow data concurrently with gas samples to a mass spectrometer comprising:

a mass spectrometer having an input port,

a tubular flowmeter element for a gas flow to be sampled and having a first end, a second end, and a flow restricting means interposed between said first and second ends;

a gas transmission tube connecting the first end of said flowmeter element to said input port of said mass spectrometer;

first means for introducing a second gas into the second end of said flowmeter element, said second gas being foreign to the gases to be sampled;

conduit means coupled between said second end and said gas transmission tube, one end of said conduit means positioned in said second end to withdraw only said second gas, the other end of said conduit means being connected into said transmission tube at a point where a sample of gas will combine with said second gas withdrawn at substantially the same instant as said sample; and

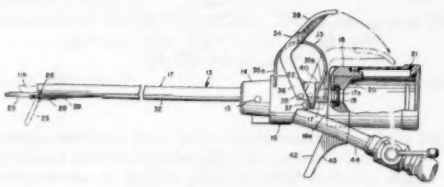
second means within said mass spectrometer for measuring the quantity of second gas in the combined sample transmitted to said mass spectrometer, said quantity being proportional to the pressure difference across said flow restricting means and indicative of the gas flow through said flowmeter.

4,178,920

UROLOGICAL INSTRUMENT WITH DEFLECTING ELEMENT

Charles D. Cawood, Jr., Houston, Tex., and John S. Ziegler, Arlington Heights, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 3, 1977, Ser. No. 838,989
Int. Cl.[2] A61B *1/00*
U.S. Cl. 128—4 **14 Claims**



1. A urological instrument having an elongated sleeve for receiving the stem of an endoscope; said sleeve having proximal and distal ends; a deflecting element pivotally connected to said sleeve adjacent the distal end thereof; said element being movable between a retracted position generally parallel with said sleeve and an extended position projecting away from said sleeve; an operating lever pivotally supported upon said sleeve adjacent the proximal end thereof for pivotal movement of said lever between first and second positions; means operatively interconnecting said lever and said element for movement of said element between its retracted and extended positions as said lever is shifted between its first and second positions; and spring means urging said lever into its first position; said lever having a free end portion movable towards the axis of said sleeve when the lever pivots from its first position to its second position; said spring means urging said lever to shift said free end portion away from the axis of said sleeve.

4,178,921

TAPERED ROLLER PRESSURE RELIEF SUPPORT

Michael Kosiak, Minneapolis, Minn., assignor to Medrest Corporation, Minneapolis, Minn.

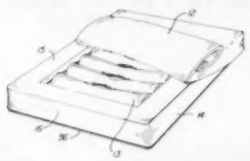
Continuation-in-part of Ser. No. 777,525, Mar. 14, 1977, abandoned, which is a continuation-in-part of Ser. No. 632,179, Nov. 17, 1975, Pat. No. 4,011,862, which is a continuation-in-part of Ser. No. 545,726, Jan. 31, 1975, abandoned. This application Mar. 27, 1978, Ser. No. 890,398
Int. Cl.[2] A61H *11/00*
U.S. Cl. 128—58 **31 Claims**

1. A structure for support of a buttocks in a partially cradled and varied pressure manner to facilitate movement of blood through the buttocks tissues, said structure comprising a sheet-

like flexible cover and a mechanical apparatus under said cover, said mechanical apparatus consisting essentially of

(i) a horizontally-oriented perimeter frame having front, rear, and side members;

(ii) a single endless flexible composite belt assembly consisting essentially of a pair of laterally spaced flexible endless base belts, a plurality of discrete roller members, an axis shaft projection from each end of each said roller member, and means for mounting said roller members through said axis shaft projections to said base belts, with said roller members in substantially parallel relationship between said base belts and freely rotatable with respect to said base belts, each said roller member being tapered from each end thereof toward the medial portion thereof, all ends of said roller members being substantially the same in diameter, all medial portions of said roller members being substantially the same in diameter but of a lesser diameter than at said ends, said taper of each said roller member being substantially circumferentially uniform and at an angle between 1° and 20° from a straight axis-parallel path between the ends of the roller member, said composite belt assembly being mounted in said frame to provide an upper stretch of said roller members under said flexible cover and a lower return stretch of said roller members,



(iii) a pair of horizontally-oriented track members mounted within said frame on said side members of said frame, said track members being laterally spaced to accommodate said roller members as transverse elements therebetween as said composite belt assembly is mounted in said frame, said track members providing support for said axis shaft projections of at least those of said upper stretch roller members intermediate the front and rear ends of said upper stretch, said track members being contoured to form a relatively depressed portion thereof at a location between the front and rear ends of said upper stretch, said relatively depressed portion being such as to allow said roller members at said portion of said upper stretch to be depressed relatively to end rollers of said upper stretch, the combination of said tapered roller members and said relatively depressed portion serving to provide a partially cradled comfort support for a buttocks, and

(iv) means for moving said composite belt assembly to cause said roller members thereof to move in sequence along said upper stretch, thereby to effect a stroking action of alternate pressure and release of pressure to facilitate blood movement through buttocks tissues resting on said structure.

4,178,922

THERAPEUTIC BELT

James D. Curlee, 347 Rivermoor Dr., Marietta, Pa. 17547

Filed Sep. 23, 1977, Ser. No. 835,867

Int. Cl.[2] A61F *5/02*

U.S. Cl. 128—78 **11 Claims**

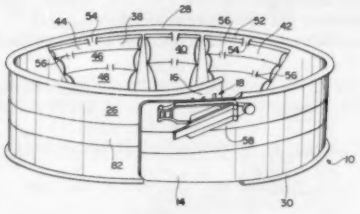
1. A therapeutic belt for application to the sacro-lumbar region of the human body comprising:

a one-piece synthetic plastic body encircling member having free ends;

cooperating releasable connecting means at said free ends for securing said body in position about a human torso;

said body including a supporting band structure having upper and lower edge portions and of sufficient thickness to retain its body encircling relationship;

a connecting strip of the same material as, but thinner than, said band structure and extending downwardly from said upper edge portion on the inner side thereof;



and a plurality of inflatable air cell assemblies of the same material as said band structure and connecting strip and integral with and depending from said connecting strip.

4,178,923

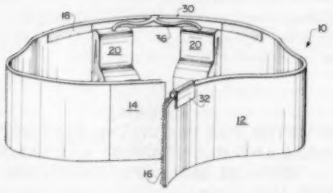
THERAPEUTIC CORSET

James D. Curlee, 347 Rivermoor Dr., Marietta, Pa. 17547

Filed Sep. 23, 1977, Ser. No. 835,868

Int. Cl.[2] A61F *5/02*

U.S. Cl. 128—78 **13 Claims**



1. A therapeutic appliance for application to the sacro-lumbar region of the human body comprising:

a band-like support means having free ends and a length sufficient to extend around the back and encircle the abdominal region of the body;

releasable connecting means embodied with free ends of said support means to secure the same in position;

at least one inflatable air cell means; and

releasable cooperating fastening means operably related between said air cell means and the surface of said support means that faces and extends across the sacro-lumbar region of the human body for releasably and adjustably positioning said air cell means within said suport means.

4,178,924

CAST PROTECTOR

Samuel H. Baxter, 3010 Graceland Ave., Northeast, Albuquerque, N. Mex. 87110

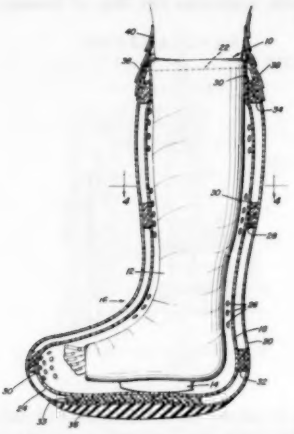
Continuation of Ser. No. 805,592, Jun. 6, 1977, abandoned, which is a continuation of Ser. No. 726,818, Sep. 27, 1976, abandoned, which is a continuation of Ser. No. 592,323, Jul. 1, 1975, abandoned. This application Feb. 10, 1978, Ser. No. 877,036

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—82 **13 Claims**

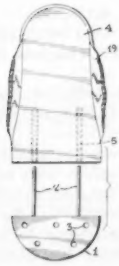
1. In combination, an elongate tubular protective cover for a cast enclosed body limb portion to be inserted into said cover from one open end thereof and with said one end including seal means for forming a substantially fluid tight seal between said one end of said cover and the adjacent body limb portion, said cover comprising inner and outer telescopingly engaged tubu-

lar members constructed of flexible material, said inner tubular member including means rendering it pervious to air flow therethrough, said outer tubular member being impervious to the flow of liquids therethrough, at least one substantially continuous band member disposed between said inner and



outer tubular members, intermediate their opposite ends, and secured to one of the opposing outer and inner surfaces thereof, said band member including means for absorbing moisture and comprising means to maintain at least the adjacent portions of said inner and outer tubular members spaced apart.

4,178,925
ADJUSTABLE POST-SURGICAL SHOE
Paul R. Hirt, 1 Needle Point La., Willingboro, N.J. 08046
Filed Mar. 7, 1978, Ser. No. 884,192
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—83.5 **7 Claims**



1. An adjustable post-surgical shoe comprising:
two sole elements,
first pin and tube connection means slidably connecting said elements for relative movement to one of several positions and second separate means securing the elements in adjusted position.

4,178,926
PEDIATRIC RESTRAINT DEVICE
Arnold K. Cohn, 2086 Drury La., Northfield, Ill. 60093
Filed May 1, 1978, Ser. No. 901,289
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **6 Claims**

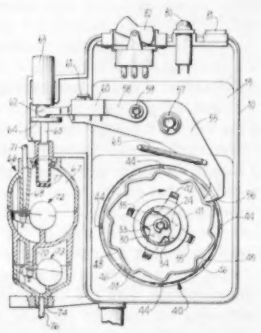
1. A restraint device for preventing a person's hands from contacting that person's legs while lying in a bed having side rails, comprising

a generally flat plate which is positioned in a generally upright manner transversely to the person along the person's waist, said plate having a bottom wall which is

contoured to define a base portion at opposite ends which is positioned on said bed on opposite sides of the person's waist, and a central portion which overlies the person's waist, and

means for releasably securing said plate to said bed.

4,178,927
INTRAVENOUS LIQUID DELIVERY SYSTEM
Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.
Continuation of Ser. No. 627,842, Nov. 3, 1975, abandoned. This application Jul. 8, 1977, Ser. No. 813,980
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 F **5 Claims**



1. In an intravenous liquid delivery system for delivery of intravenous liquid from a source of supply to the patient, intravenous pump having a liquid filled chamber and having an inlet adapted to be connected to the source of supply, and an outlet adapted to be connected to the patient, a reciprocating plunger for causing the flow of intravenous liquid to be pumped through the pump chamber from the inlet to the outlet and an actuator for causing the reciprocatory movement of said plunger, said actuator including housing, drive means carried by the housing and having a rotatable output shaft, a set of removable cam members, each of said cam members having a plurality of peaks and valleys, said peaks and valleys on each of said cam members being different from the other cam members, a selected one of said cam members being coupled to said shaft so that it is driven thereby, a cam follower carried by said housing, yieldable means urging the cam follower into engagement with said cam member so that the cam follower is caused to move in accordance with the peaks and valleys of the selected cam as the rotatable shaft is rotated and means coupled to the cam follower for providing reciprocatory motion from

the cam follower for driving the plunger of said pump whereby intravenous liquid is dispensed by the pump in accordance with the selected one of said cam members.

4,178,928

SELF INJECTOR

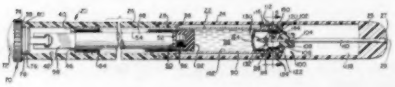
Edward A. Tischlinger, 7 Froghollow Rd., East Lyme, Conn. 06333

Filed Aug. 10, 1977, Ser. No. 823,419

The portion of the term of this patent subsequent to Feb. 7, 1995, has been disclaimed.

Int. Cl.[2] A61M *5/20*

U.S. Cl. 128—215 **8 Claims**



1. A self injector comprising in combination:

a spring powered gun assembly, said assembly including a cylindrical housing, a plunger rod movably carried within said housing, spring means for actuating the plunger rod, and retaining means for holding the spring means in compressed position and upon actuation for releasing said spring means; and

a cartridge assembly connected to the gun assembly, said cartridge assembly comprising a cylindrical shield connected to the gun housing, a cartridge slidably carried within the shield, said cartridge including a cylindrical tube, a plunger slidably mounted in the rearward end of said tube to close same off, a diaphragm positioned in the forward end of the tube to close off that end of the tube and form a medicament chamber between the plunger and the confronting face of the diaphragm, a nose piece fitted on the forward end portion of the tube, said nose piece having a body portion with a central bore therethrough and aligned with the longitudinal axis of the cartridge tube, the body portion having a forward and a rearward face, means extending forwardly from the nose piece body and in fluid communication with the aforesaid bore for receiving and mounting an injection cannula, means extending rearwardly from the nose piece body to receive the forward end of the cartridge tube, a spike distinct from any injection needle that might be mounted on the forward needle mounting means on the rearward side of the nose piece body with its point directed rearwardly, means for mounting the spike in the aforesaid position, and

a diaphragm positioned in the forward end of the cartridge tube on the rearward side of the nose piece body, said diaphragm comprising a cylindrical body having a forward open end, a flexible and pierceable diaphragm portion closing off the rearward end, the diaphragm fits around and over the spike with the diaphragm closed end being spaced rearwardly of the spike point, whereby with the plunger rod aligned with the plunger firing of the gun will cause the plunger rod to move the plunger and force the medicament in the medicament chamber to flex the diaphragm and pierce same in the spike to establish flow from the medicament chamber to and through the cannula, said cartridge tube being simultaneously moved to insert the cannula in the prescribed locus.

4,178,929

DOSING DEVICE FOR GERM-FREE MEASUREMENTS AND FILLING OF LIQUID MATERIAL

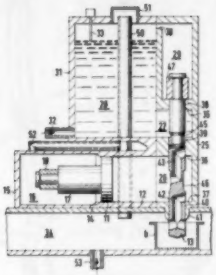
Guenther Voegele, Schönaich, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,314

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658147

Int. Cl.[2] A61J *7/00*

U.S. Cl. 128—213 R **3 Claims**



1. A dosing device for germ-free measuring and filling of individual portions of a liquid material, comprising:

a supply chamber for the liquid material;

a filling chamber to which a measured quantity of liquid material is delivered; and

a dosing pump connected to the supply chamber and the filling chamber, for delivering the measured quantity of liquid material from the supply chamber to the filling chamber, said dosing pump including:

(i) a piston; and

(ii) an extended chamber to allow a freeing of the piston, wherein the upper portion of the supply chamber, the extended chamber and the filling chamber are interconnected by rigidly arranged channels, and wherein the supply chamber, the extended chamber and the filling chamber are in contact with a sterile atmosphere maintained within said rigidly arranged channels.

4,178,930

COMBINED CAP AND NEEDLE STRUCTURE

Frank R. Fisher, Jr., 9614 N. Charlotte Ave., Kansas City, Mo. 64155

Filed Oct. 31, 1977, Ser. No. 847,158

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—215 **4 Claims**

1. A combined cap and needle structure adapted for use with a syringe tube having a hollow body portion with a plunger end and a discharge end and a neck portion integrally formed with said body portion to provide a discharge opening at the discharge end of said body portion, said neck portion being of a reduced diameter and tapered to its discharge opening, said cap and needle structure comprising:

a cap member having an opening defined therein, said opening being arranged to receive the neck portion of said syringe tube to removably install said cap member on the syringe tube;

said cap member is also provided with a cylindrically shaped bore which is adjacent to said opening and interconnected with said opening by a hollow channel;

a sealing member positioned within said opening between the discharge opening of the neck portion of said syringe tube and said hollow channel to substantially seal the discharge opening of said syringe from the passage of fluid;

the needle having inlet and outlet ends with a passage extending between the inlet and outlet ends thereof;

a guide member attached to a portion of said needle interme-

diate its inlet and outlet ends, said guide member having a cylindrically shaped base portion which fits slidably within the cylindrical shaped bore of said cap member to move the needle from a non-piercing position wherein the inlet end of said needle is in proximity to said sealing member to a piercing position wherein the inlet end of said

needle passes through said sealing member into communication with the interior of said syringe tube; and

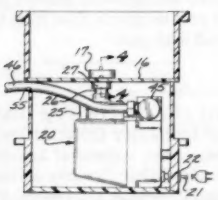
a frangible heat seal connecting said guide member to said cap member in a non-piercing position, said frangible heat seal being adapted to be broken to permit movement of the needle to said piercing position.

4,178,931

PORTABLE BIDET, ENEMA AND DOUCHE

Gene C. Lind; Ralph C. Lind, both of 3701 Lewis Ave., Long Beach, Calif. 90807; Frank L. Lind, 5958 Gaviota, Long Beach, Calif. 90805; Edmund K. Burchman, 2642 Copa De Oro Dr., Los Alamitos, Calif. 90720, and Robert Trauger, 19127 S. Pioneer Space 95, Artesia, Calif. 90701

Filed Dec. 5, 1977, Ser. No. 857,228
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—230 **5 Claims**



1. A portable cleansing assembly comprising:

a pump assembly adapted for excitation by a source of A.C. electrical power;

a first rectangular, hollow container including a rectangular first interior cavity conformed to support said pump assembly, said first container including a planar peripheral surface surrounding said first cavity, the free edge of said surface being conformed to define a plane;

an input fitting attached to said pump and including an input pipe aligned to extend across said plane defined by said free edge of said peripheral surface, said input pipe includes an end closure formed on the free end thereof, a cylindrical projection extending axially from said end closure and a plurality of bores formed in said end closure in circumferential alignment around said projection;

a second rectangular hollow container including a second cavity conformed for telescopic receipt of said peripheral surface in a first mode of cooperative alignment and to be supported on said edge in an inverted arrangement in a second mode of cooperative alignment;

a spring loaded normally closed poppet valve assembly extending across the surface of said second container in receiving alignment with said input pipe when said second container is inverted according to said second mode whereby said poppet valve assembly is unseated by said input pipe, said poppet valve assembly including a valve housing disposed on the interior of said second cavity, a plurality of openings formed in the lateral surfaces of said housing, a through-wall fitting extending from the interior of said housing to the exterior of said second container conformed to receive said input pipe, and a spring-loaded valve urged against said fitting within said housing and deployed for vertical translation by said cylindrical projection;

output fitting means connected to said pump; and

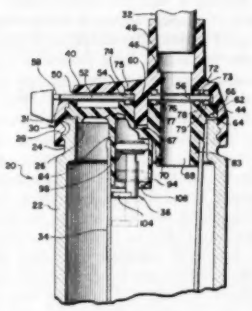
liquid dispensing means connected to said output fitting means for dispensing liquids deposited in said second container and transferred through said poppet valve assembly and said pipe.

4,178,932

VACUUM CURETTAGE DEVICE WITH VACUUM INDICATOR

Francis E. Ryder, Barrington, Ill., and Michael D. Thomas, Arab, Ala., assignors to Ryder International Corporation, Barrington, Ill.

Filed Sep. 6, 1977, Ser. No. 830,770
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—276 **11 Claims**



1. A medical device such as a curette or the like, comprising a vessel including cover structure with aperture means in the cover for attachment of a medical implement, such as a cannula, or the like, which vessel is adapted to be evacuated, valve means intermediate said vessel and said medical implement for selectively applying said vacuum to said medical implement, vacuum indicator means carried by said cover structure, interiorly of said vessel to provide a visual indication corresponding to the presence or absence of a vacuum in said vessel, said vacuum indicator means including cylinder means having a closed end and an open end, a piston member having a head portion disposed in said open end of said cylinder means, an O-ring carried by said head portion to adapt said head portion for sliding sealed engagement with the walls of said cylinder means and said piston also having a shaft of lesser diameter dimension than said head portion, and guide means with said cylinder open end receiving said shaft to maintain said head portion in co-axial alignment with said cylinder, thereby guiding the sliding sealed movement of said head portion within said cylinder means, said cylinder means including a recessed portion in said closed end and said head portion being of a lesser diameter dimension than said cylinder means to allow said head portion to enter said cylinder means in a tilted posi-

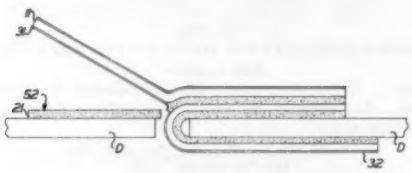
tion for displacing a quantity of air from said cylinder upon assembly and for retaining a residual supply of air such that said piston member may be disposed in said cylinder means proximate the closed end thereof at atmospheric pressure to trap a quantity of air in said recessed portion, and said piston member further comprising an indicator member carried by said shaft whereby upon evacuation of said vessel a pressure differential will exist across said piston causing said retained quantity of air to expand and move said piston toward said open end, with the position of said indicator member being adapted to be employed to provide a visual indication of the existance of a vacuum in said vessel.

4,178,933

EXTRACTIVE TRANSFER DIAPER TAB MEANS

Suzette B. Nemeth, Painesville, Ohio, assignor to Avery International Corporation, San Marino, Calif.

Filed Mar. 23, 1977, Ser. No. 780,411
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 **3 Claims**



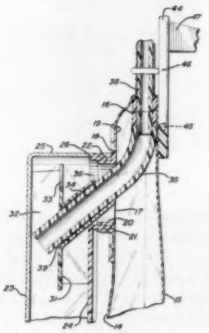
1. A diaper having a linerless refastenable two-substrate diaper tab formed of diaper tab stock comprising a web construction made up of initially flat but flexible substrate material and suitable to be formed in long passes along the machine direction of a coating and laminating line and to be rolled up for storage and shipment, and unrolled for use by diaper manufacturers, and fabricatable for storage and shipment completely by web coating and web-to-web laminating operations and without the necessity for folding or slitting operations, and suitable for high speed dispensing on automatic equipment, said tab including a first substrate extending, transversely to machine direction, along first and second length portions and bearing first substrate adhesive on its underside at both said length portions, a second substrate extending along said first and second length portions and bearing second substrate adhesive on its underside at both said first and second length portions, first and second release means for said first substrate adhesive being located respectively above and below said first substrate adhesive at said second length portion, said first length portion being substantially free of both first and second release means, said first release means being on the underside of said first substrate and said second release means being on the topside of said second substrate, said second release means having physical and structural characteristics for providing a release from said first substrate adhesive at a lower separating force level than that required by the physical and structural characteristics of said first release means, the tab initially being applied to one edge of a diaper with the first length portions of the second substrate adhesive, second substrate, first substrate adhesive, and first substrate respectively layered on one side of said one diaper edge and with the second length portions of the second substrate adhesive and second substrate, the second release means, the second length portion of the first substrate adhesive, the first release means and the second length portion of the first substrate respectively layered on the opposite side of said one diaper edge, whereby when the tab, mounted on said one edge of the diaper, is manipulated in the normal manner by a person who fastens and then unfastens the diaper by separating the second length portion of the first substrate adhesive, first release means, and second length portion of the first substrate from the second release means and applying the same to another part of the diaper for fastening and then removing the first release means and second length portion of the first substrate for unfastening, the part of said first substrate adhesive that is at said second length portion being exclusively extractively transferred from between said first and second substrates and from said second length portion of said first substrate permanently to said other part of the diaper.

4,178,934

URINE METER AND COLLECTION ASSEMBLY

Hugh M. Forman, Waukesha, Wis., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Dec. 27, 1977, Ser. No. 864,178
Int. Cl.[2] A61R *5/44*
U.S. Cl. 128—295 **9 Claims**



1. A urine metering and collection assembly comprising:
a fluid collection container having at least one flexible wall, a first inlet port near the top end of said container and a transfer port in said flexible wall below said inlet port;
a rigid measuring container having at least one first volume calibrated compartment, said first volume calibrated compartment, having a second inlet port;
means for attaching said measuring container to said flexible wall, said means aligning said transfer port and said second inlet port; and
a flexible tubular conduit continuously extending from said first inlet port, through said transfer port and into said second inlet port to deliver fluid from said first inlet port to said second inlet port.

4,178,935

METHOD AND APPARATUS FOR DISINTEGRATION OF URINARY CONCRETIONS

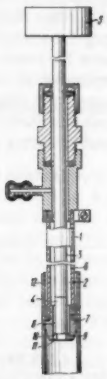
Boris S. Gekhman, ulitsa Parizhskoi kommuny, 22-B, kv. 24; Petr N. Vasilevsky, bulvar Druzhby narodov, 8, kv. 27; Jury G. Ediny, prospekt 40-letia Oktyabrya, 88, kv. 67; Ivan V. Parfinenko, ulitsa Kochubeevskaya, 12[a], kv. 1, and Alfred M. Podgursky, Elektrotekhnichesky pereulok, 3, kv. 10, all of Kiev, U.S.S.R.

Filed Jul. 21, 1977, Ser. No. 817,787
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—328 **12 Claims**

1. An apparatus for disintegration of urinary concretions comprising:
a catheter for insertion into the ureter;
a bushing having an axial bore coaxially mounted on one end of said catheter, having an inwardly projecting annular lip, said lip defining an axial bore smaller than the axial bore of said bushing and being provided with longitudinal through ducts extending through said lip for the supply of liquid to the region of the concretion;
an operating element within said catheter adapted to act upon the concretion and provided with a bearing surface adjacent said lip having a cross section larger than the

axial bore defined by said lip, said bearing surface interacting with said lip inside said bushing for restriction of axial movement of said operating element from said bushing; and

a coupling member supporting said operating element on one end, means connected to said coupling member on the



opposite end for transmitting power to said operating element via said coupling member to activate it, said coupling member being coaxially disposed in said catheter; and

wherein said bushing and the lip thereof are shaped and sized to permit alternate mounting of a milling cutter and a discharge arrester to be used as said operating element.

4,178,936

APPARATUS FOR USE IN COLLECTING EGGS FROM ANIMALS

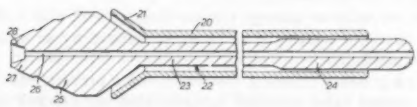
Raymond Newcomb, Sudbury, England, assignor to Milk Marketing Board, Surrey, England

Filed Jul. 27, 1977, Ser. No. 819,419

Claims priority, application United Kingdom, Aug. 2, 1976, 32184/76

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—349 B **8 Claims**



1. An apparatus for collecting eggs from the upper reaches of the uterine horn of an animal, which apparatus comprises:

(i) an introducer comprising (a) a generally rigid tubular outer member open at both ends and having a smooth leading end region, and (b) an inner member locatable within the outer member and provided over its length with a duct, the inner member having a smooth leading end region; and

(ii) a catheter of greater length than the introducer and comprising (a) a flexible tubular portion provided over at least part of its length with a plurality of internal channels and terminating at one end in a leading region, and (b) an inflatable cuff provided on the outside of an intermediate region of the tubular portion; wherein a first channel within the tubular portion communicates with at least one outwardly opening hole in the leading region, a second channel within the tubular portion communicates with at least one outwardly opening hole in the tubular portion in a region between the inflatable cuff and the leading region; and a third channel within the tubular portion communicates with the interior of the inflatable cuff; wherein the tubular portion and cuff, when non-inflated, are slidable within the rigid tubular outer member of the introducer; and wherein, when the inner member is within the outer member with the leading end of the inner member projecting slightly beyond that of the outer member, the leading end region of the introducer is generally smooth such that the leading end region of the introducer can be passed through the cervix of the animal without snagging any tissue; the arrangement being such that, in use, the leading region of the introducer is passed through the cervix of the animal with the inner member within the outer member, after which mucous may be withdrawn through the duct of the inner member, the inner member is withdrawn from the outer member, and the catheter is introduced into the outer member until the cuff has passed beyond the outer member, the flexibility of the catheter permitting the catheter to follow the curve of the uterine horn, whereupon, once the leading end region of the catheter is in the desired position, the cuff is inflated and fluid introduced through the first channel.

4,178,937

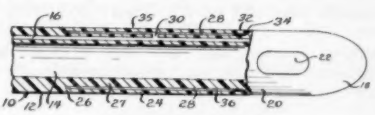
CATHETER WITH INTEGRAL BALLOON AND METHOD

Glenn N. Taylor, Cary, and Bhupendra C. Patel, Elgin, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Sep. 1, 1977, Ser. No. 829,868

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—349 B **7 Claims**



1. A catheter comprising, an elongated shaft of elastic material having a main lumen, and an annular sleeve overlying a distal surface region of said shaft, with one end of said sleeve being of one-piece construction with the shaft, with said shaft being of one-piece construction intermediate said distal surface region including said sleeve and a proximal end portion of the catheter located outside the patient's body when the catheter is placed in the body, with a circumferential end portion of said sleeve spaced from said one sleeve end being bonded to the shaft to define a cavity between the sleeve and said shaft surface, and with said one sleeve end being proximal said circumferential end portion of the sleeve, and means defining an inflation lumen extending along the shaft and communicating with said cavity to inflate the sleeve.

4,178,938

PRESSURE CONTROL SYSTEMS

Anthony S. Au, P.O. Box 2593, Station A, Sudbury, Ontario, Canada (P3A 4S9)

Filed Jun. 24, 1977, Ser. No. 809,802

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—207.15 **9 Claims**

1. A self-contained automatic penumatic vent valve comprising;

(a) a body,

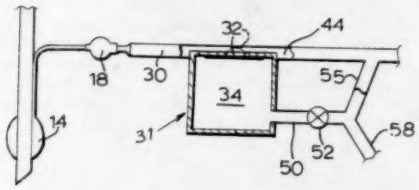
(b) a through passage opening through said body, said through passage having a longitudinally extending first side wall which is arcuate in shape in a direction transverse to its longitudinal extent,

(c) an enclosed pressure chamber formed in said body and disposed outwardly from said through passage,

(d) a valve passage extending between said pressure chamber and said through passage, said valve passage having a first

end disposed opposite and opening toward said first side wall of said through passage,

(e) a flexible valve closure member mounted in said body and extending across said first end of said valve passage to close said valve passage, said flexible closure member being disposed opposite said first side wall of said through passage in a face-to-face relationship therewith and being extendable from a first position in which it is spaced from said first side wall to permit free flow of fluid through said through passage to a second position in which it extends into engagement with said first side wall to close said through passage in response to variations in the differential pressure between the pressure in said pressure chamber and the pressure in said through passage,



(f) a single input passage means opening into said pressure chamber for admitting air under pressure to and venting air from said pressure chamber,

(g) valve means in said single input passage which is operable for selectively opening and closing said input passage whereby when said valve is closed it completely isolates said pressure chamber such that after pressurizing said pressure chamber, said valve may be closed and said pneumatic vent valve may operate automatically to open and close said through passage as required in use.

4,178,939

VISUAL INDICATOR FOR CUFF-TYPE CATHETER

Thomas P. Stephens, Boxford, Mass., assignor to Portex, Inc., Wilmington, Mass.

Filed Sep. 29, 1977, Ser. No. 838,026
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—207.15 **7 Claims**

1. A deformable apparatus for visually indicating the shape of an inflatable cuff that surrounds a surgicomedico catheter and the like of the type adaptable for insertion into a body passage, and comprising:

a deformable, hollow-walled indicator enclosing a substantially empty, chamber-like area and including first and second apertures each extending through a wall portion thereof;

a tubular-connecting member including a first end portion in fluid-tight engagement with a wall portion forming said first aperture, said tubular member further including a second end portion in fluid-tight engagement with said inflatable cuff to provide a continuous, fluid-tight passageway between the chamber of said indicator and said cuff;

fluid pressure means in fluid-tight engagement with a wall portion forming said second aperture for selectively varying the fluid pressure within said continuous, fluid-tight passageway to inflate and deflate said indicator and said cuff, respectively; and

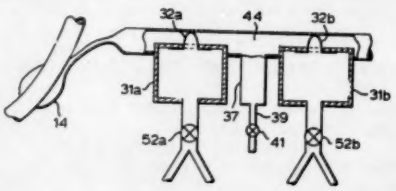
preformed deformable ridge means extending substantially longitudinally along substantially the length of said hollow-walled indicator for controlling the configuration of said indicator responsive to selective actuation of said fluid pressure means, said ridge means being present in odd numbered multiples thereof preventing occlusion of said indicator chamber during deflation of said cuff.

4,178,940

PRESSURE CONTROL SYSTEMS

Anthony S. Au, P.O. Box 2593, Station A, Sudbury, Ontario, Canada (P3A 4S9)

Continuation-in-part of Ser. No. 809,802, Jun. 24, 1977. This application Feb. 15, 1978, Ser. No. 877,986
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—207.15 **4 Claims**



1. An inflatable cuff system for a tracheal or endotracheal tube or the like, comprising:

(a) an inflatable cuff,

(b) an inflation passage communicating with said cuff by means of which the cuff may be inflated by an inflating medium,

(c) a pressure releasing first valve and a pressure releasing second valve arranged in series with one another in the inflation passage for regulating the flow of inflating medium through the inflation passage,

(d) said first and second valves being spaced from one another to provide a reservoir for inflating medium therebetween,

(e) said first valve being located between said cuff and said reservoir and being set to open to permit inflating medium to escape from said cuff into said reservoir when the pressure in the cuff rises above a predetermined first pressure,

(f) said second valve being located outwardly from said reservoir in relation to the cuff and being set to open to permit inflating medium to escape from said reservoir when the pressure in the reservoir rises above a predetermined second pressure which is greater than said first pressure whereby at least a portion of the inflating medium displaced from the cuff into the reservoir may be retained in the reservoir at a pressure up to said second pressure and may be returned to said cuff when the pressure in the cuff drops below the pressure in the reservoir.

4,178,941

METHOD FOR DRAWING A BLOOD SAMPLE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Division of Ser. No. 715,678, Aug. 19, 1976, abandoned, which is a continuation of Ser. No. 542,578, Jan. 20, 1975, abandoned. This application May 9, 1977, Ser. No. 795,187
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—763 6 Claims

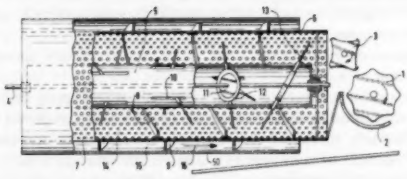
1. A method of drawing a blood sample into a syringe having a barrel with a barrel floor, a needle, a plunger with a compressible plunger tip forming with the end of said barrel a chamber containing anti-coagulant and means to limit the minimum size of said chamber by movement of said plunger to its innermost limit, said method comprising expelling from said chamber air which is present and anticoagulant in excess of an amount sufficient to prevent coagulation in the blood sample to be taken but less than an amount which will adversely affect the test to be performed by moving said plunger into the syringe to said innermost limit, and thereafter inserting said needle into a blood vessel of a patient and allowing the blood pressure of the patient to force the blood sample into the chamber and thereby move said plunger outwardly, whereby the blood sample mixes with the anticoagulant left in said syringe.

4,178,942

APPARATUS FOR AGRICULTURAL MACHINES

Josef Nusser, D-7963 Eichstegen, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,646
Int. Cl.[2] A01F *7/06*
U.S. Cl. 130—23 27 Claims



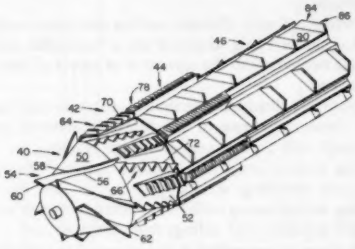
26. An apparatus for conveying material comprising:
a frame;
a central shaft mounted on said frame;
a first wall means defining an outer cylinder mounted on said shaft with its longitudinal axis in a substantially non-vertical position;
a second wall means defining an inner cylinder disposed within said outer cylinder and mounted on said central shaft with its longitudinal axis in a substantially non-vertical position, said second wall means of said inner cylinder defining apertures therein;
a plurality of discs spaced along and secured to said shaft with the plane of each disc at a non-right angle relative to said central shaft;
a ring mounted around the periphery of each said disc in the plane of the disc and adapted to rotate relative to said disc; and
tines secured to said ring in the plane of the ring and projecting outwardly through said apertures on said inner cylinder and into the space between said inner and outer cylinders whereby relative rotation of said shaft and said cylinders causes said tines to rotate and to move said material along the space between said cylinders.

4,178,943

ROTOR FOR AN AXIAL FLOW ROTARY SEPARATOR

Neil L. West, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 24, 1978, Ser. No. 889,626
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—27 T 33 Claims



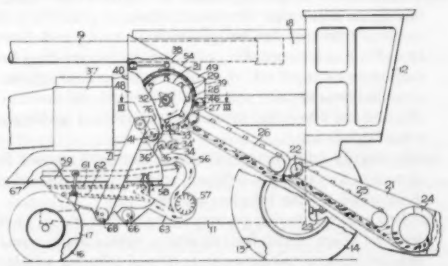
1. In an axial flow rotary separator for processing crop material including a housing having walls including a foraminous portion, an inlet for receiving crop material and an outlet axially spaced downstream from the inlet, an improved rotor, mounted for rotation in the housing about an axis of rotation and disposed so as to create in cooperation with the housing an annular space extending axially between the inlet and the outlet, comprising:
a frame;
a plurality of material control blades carried by the frame, each blade being inclined away from a radial line passing through the blade and having a line of slope directed generally downstream and having a radially inwardly disposed inner edge and a radially outwardly disposed working edge, said working edge having, with respect to rotor rotation, a leading and a trailing portion and being disposed substantially athwart the direction of rotation with the leading portion upstream of the trailing portion, said blades being disposed to engage crop material delivered to the inlet and propel it in the annular space, cooperating with the housing to agitate and separate the material so that a first portion is expelled through the foraminous portion of the housing wall and said working edges urging the material downstream so that a second portion is discharged through the outlet.

4,178,944

TAILINGS RETURN FOR AN AXIAL FLOW COMBINE

Roger D. Hanaway, Blue Springs, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 11, 1977, Ser. No. 841,212
Int. Cl.[2] A01F *7/00*
U.S. Cl. 130—27 R 11 Claims



1. In an axial flow combine for harvesting seed, the combination comprising:

a threshing section including

a housing having walls including a pair of lateral spaced vertical sidewalls extending in the longitudinal direction of the combine and a transversely extending discharge opening permitting discharge of threshed material from the threshing section,

a foraminous cylindrical cage extending between said sidewalls,

a threshing cylinder disposed within said cage, said cage and cylinder being disposed on a horizontal axis disposed transverse to the direction of travel of said combine, and

a transversely disposed distribution auger in said housing for conveying some of the threshed material passing through said cage to said discharge opening,

a cleaning section receiving threshed material discharged from said threshing section by way of said discharge opening, said cleaning section including means or separating light particles and tailings from the seed and

a tailings elevator connected at its lower end to said cleaning section to receive said tailings and having its upper end disposed in delivery relation to said distribution auger.

4,178,945

CIGARETTES HAVING AN INDIVIDUAL LIGHTING MEANS, AND METHOD OF MAKING THEREOF

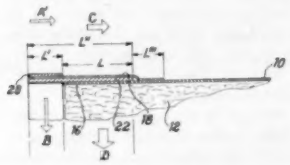
Francesco De Capitani, Corso Magenta 83, Milan, Italy

Filed Jan. 10, 1977, Ser. No. 760,768

Claims priority, application Italy, Jan. 26, 1976, 19580 A/76

Int. Cl.[2] A24C *5/60;* **A24D** *1/08*

U.S. Cl. 131—23 R **4 Claims**



1. A process for manufacturing tobacco articles, such as cigarettes, small cigars and the like, having on outer ends thereof self-lighting means for lighting the tobacco articles without the use of external heat sources, said process comprising:

providing conventional tobacco articles and advancing said tobacco articles in a feed direction, with said tobacco articles arranged in pairs extending transverse to said feed direction, and with adjacent ends of said tobacco articles of each said pair being coaxially spaced;

forming an elongated continuous composite band including a continuous supporting band of combustible material having on a first side thereof a continuous outer band of a first material that can be ignited by rubbing and that allows for a quick spreading of flame, said supporting band having on a second side thereof a continuous inner band of a second material that can easily be ignited and that can be charred and converted into embers capable of igniting said tobacco articles;

longitudinally advancing said composite band in said feed direction to a position adjacent said adjacent ends of said pairs of advancing tobacco articles;

dividing said advancing composite band into pieces having lengths, taken in said feed direction, substantially equal to the circumferential dimensions of said tobacco articles;

wrapping each said piece circumferentially around said adjacent ends of a respective said pair of tobacco articles, such that said first material is positioned radially outwardly and said second material is positioned radially inwardly and in contact with the outer circumferences of said ends of said respective pair of tobacco articles; and

dividing the thus wrapped pieces substantially between the said adjacent ends of said respective pairs of tobacco articles.

4,178,946

APPARATUS AND METHOD FOR CONTROL OF AIR RELATIVE HUMIDITY WITH REDUCED ENERGY USAGE IN THE TREATMENT OF TOBACCO

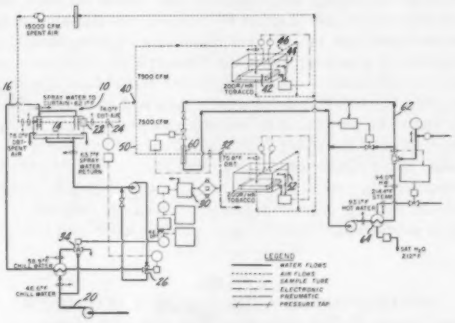
Jack B. Knight, Richmond, Va., assignor to Philip Morris Incorporated, Richmond, Va.

Division of Ser. No. 699,880, Jun. 25, 1976, Pat. No. 4,089,666.

This application Sep. 26, 1977, Ser. No. 836,525

Int. Cl.[2] A24B *3/02, 3/04*

U.S. Cl. 131—135 **17 Claims**



15. Apparatus for moistening relatively dry tobacco to provide same with a desired predetermined moisture content with a conditioned air stream having desired predetermined dry bulb temperature and relative humidity values, which apparatus comprises

means for establishing and maintaining a water spray curtain,

means for passing the air through said water spray curtain to condition it, said water spray curtain being disposed transversely of the direction of the air flow and presenting a variable area of heat exchange confrontation to said flow,

means for conveying a first portion of said conditioned air through the tobacco to add moisture thereto up to a certain content less than said predetermined moisture content,

means for heating the remainder portion of said conditioned air to reduce the relative humidity thereof by a predetermined level and means for passing said remainder portion of said conditioned air through the tobacco to add sufficient additional moisture thereto to raise the tobacco moisture content to said desired predetermined content,

means for sensing the dry bulb temperature of the conditioned air downstream of the spray curtain and varying the spray curtain area responsive to variations of the sensed dry bulb temperature from said desired predetermined value to correspondingly control the quantity of heat exchange effected to the air stream in said spray curtain, and

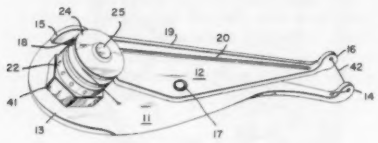
means for sensing the dew point temperature of the conditioned air stream downstream of the spray curtain and controlling the temperature of the water supplied to said spray curtain responsive to variations of the sensed dew point temperature from a predetermined value thereby to control the dew point temperature of said conditioned air at said predetermined value whereby the air leaving said spray curtain is at said desired relative humidity value.

4,178,947

TENSIONING DEVICE FOR A DENTAL FLOSSING APPARATUS

Phyllis J. McCourry, 3306 McCourry St., Bakersfield, Calif. 93304, and Victoria L. Fuhrman, 4506 Knoll Dr., Bakersfield, Calif. 93308

Filed Feb. 1, 1978, Ser. No. 874,261
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—92 R **2 Claims**



1. In a dental flossing apparatus an improved tensioning mechanism for use in combination with dental floss on spool in a hexagonally shaped dental floss container having an inner lip, said improved tensioning mechanism comprising:

a. a first elongated member, which has a hexagonally shaped hole at a first end in which the dental floss container is snugly placed and which has a raised tip-portion at a second end, said raised tip-portion having a hole which is disposed perpendicularly to said first elongated member and through which the dental floss passes;

b. a second elongated member, which also has a first end and a second end, having a raised tip-portion at its second end that has a hole which is disposed perpendicularly to said elongated member and through which the dental floss passes, said second elongated member is formed so that when it is pivotally coupled to said first elongated member in a scissor-like manner said raised tip-portion of said second elongated member will separate from said raised tip-portion of said first elongated member when said first ends of said first and second elongated members are brought together;

c. dispensing means for controlling the dispensing of the dental floss from the dental floss container, mechanically coupled to said first and second elongated members, said dispensing means comprising:

a. a shaft which forceably engages the dental floss spool;

b. a disc is positively placed into the floss container so that its peripheral edge is adjacent to the inner lip of the dental floss container, said disc is mechanically coupled to said shaft; and

c. a collecting spool, which receives used dental floss, mechanically coupled to said shaft; and

d. a ratchet system mechanically coupled to said collecting spool so that it allows said collecting spool to rotate in only one direction.

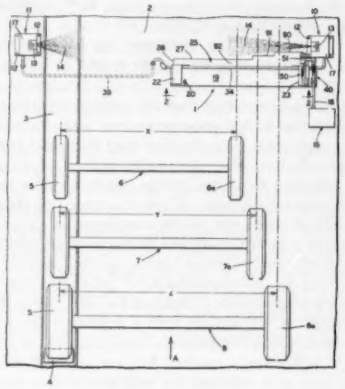
4,178,948

APPARATUS FOR USE IN CLEANING VEHICLE TIRES

Lonn L. Swinehart, 1215 Seventh St. NE., North Canton, Stark County, Ohio 44720

Filed Sep. 6, 1978, Ser. No. 940,444
Int. Cl.[2] B08B *3/02;* **B60S** *3/04*
U.S. Cl. 134—45 **18 Claims**

1. An apparatus for cleaning the sidewalls of tires of passing vehicles in an automatic carwash system of the type having fluid spray nozzle means for spraying the sidewalls of the passing vehicle tires with a cleaning fluid, a supply of cleaning fluid communicating with the nozzle means, valve means for controlling the flow of cleaning fluid to the nozzle means, and treadleplate means mounted in the travel path of at least one of the vehicle tires and having a movably mounted contact plate communicating with the valve means for actuating said valve means when the contact plate is depressed by a passing vehicle tire, wherein the improvement includes a stepped outer end formed on the contact plate providing a plurality of tire contact zones of different lengths for regulating the activation



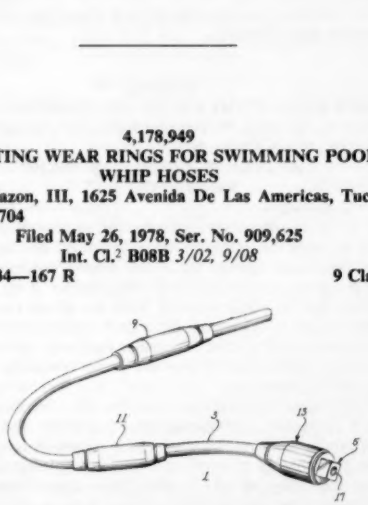
time of the valve means depending upon the particular contact zone contacted by a vehicle tire.

4,178,949

ROTATING WEAR RINGS FOR SWIMMING POOL WHIP HOSES

Gus G. Mazon, III, 1625 Avenida De Las Americas, Tucson, Ariz. 85704

Filed May 26, 1978, Ser. No. 909,625
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—167 R **9 Claims**



9. A rotational device for use on a flexible whip hose for cleaning a swimming pool, said rotational device comprising in combination:

(a) rotating means concentrically disposed about said flexible whip hose for rolling along interior surfaces of the swimming pool while supporting said flexible whip hose to prevent abrading of said flexible whip hose by the interior surfaces; and

(b) bearing means concentrically disposed on and frictionally engaging said flexible whip hose for axially and rotatably supporting said rotating means, said bearing means including a first cylindrical tubular shaft concentrically disposed about and frictionally engaging said flexible whip hose and having an outside diameter less than the inside diameter of said cylindrical collar, the difference between said outside diameter and said inside diameter being a predetermined tolerance dimension selected to permit substantially free rotation of said cylindrical collar about said first cylindrical tubular shaft.

4,178,950
RESIDUAL FUEL COMPOSITIONS WITH LOW POUR POINTS

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,915
Int. Cl.[2] F17D *1/17*
U.S. Cl. 137—13 9 Claims

1. A low pour residual fuel oil composition comprising a major amount of a high pour point, low sulfur, waxy, residual fuel and a minor amount of a low wax, low pour residual fuel oil and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of a terpolymer comprising recurring units of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

7. In the transportation of residual fuel oils, the improvement which comprises introducing into a pipeline a low pour residual fuel composition comprising a major amount of a high pour point, low sulfur waxy residual fuel and a minor amount of a low wax, low pour residual fuel and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of a terpolymer comprising recurring units of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

4,178,951
LOW POUR POINT CRUDE OIL COMPOSITIONS

William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,197
Int. Cl.[2] F17D *1/17*
U.S. Cl. 137—13 9 Claims

1. A crude oil composition having improved pour point characteristics comprising a waxy crude oil and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of (A) a terpolymer of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and (B) a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

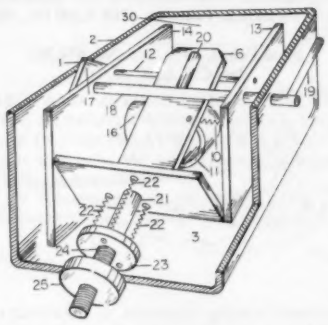
7. In the transportation of crude oils, the improvement which comprises introducing into a pipeline the crude oil composition comprising a waxy crude oil and an effective pour depressant amount of an oil-soluble polymer selected from the group consisting of (A) a terpolymer comprising of vinyl acetate, ethylene and an olefin selected from the group consisting of propylene and butylene and a graft copolymer comprising an ethylene-vinyl acetate copolymer backbone having grafted thereto an olefin selected from the group consisting of propylene and butylene.

4,178,952
INERTIAL VALVE

William J. Baker, 1469 Belview, Apt. 702, Burlingame, Calif. 94010, and Gerry L. Baker, 34 Alviso Ct., Pacifica, Calif. 94044

Filed Oct. 20, 1977, Ser. No. 843,881
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—38 9 Claims

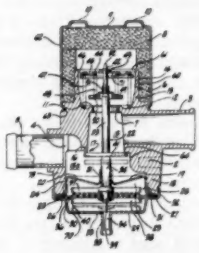
1. A safety inertial valve system which comprises:
a. a housing;
b. at least one first valve contained within said housing,
c. means for closing said first valve in response to vibration;
d. means for opening said first valve;
e. at least one second valve contained within said housing; and
f. means for opening and closing said second valve coupled to said first valve opening means said means for opening said first valve and said means for opening and closing said second valve causing said second valve to be closed while opening said first valve.



4,178,953
FAIL SAFE BYPASS VALVE

Jack M. White, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,955
The portion of the term of this patent subsequent to Dec. 18, 1995, has been disclaimed.
Int. Cl.[2] F02B *75/10*
U.S. Cl. 137—116 6 Claims



1. A valve structure comprising:
a valve body having inlet and outlet openings and main and by-pass ports in said valve body, said valve body having a passage between said inlet opening, said main valve port, said by-pass port and said outlet opening;
a diaphragm chamber structure mounted to said valve body;
a source of engine vacuum connected to said chamber;
a diaphragm assembly mounted in said diaphragm chamber structure, said diaphragm assembly including a valve stem having a first end and a second end, and a flexible diaphragm mounted to said second end of said valve stem, said diaphragm being flexible in response to variations in said engine vacuum forces acting on it so as to define at least a first position and a second position for said valve stem and wherein a low vacuum will permit said first position and a high vacuum will urge said diaphragm to said second position;
a first valve member fixed to said valve stem and adapted to close said main outlet port in said first position of said valve stem;
a second valve member of a diameter substantially equal to said by-pass port for engaging said by-pass port and movably mounted on said valve stem, movement of said second valve member being independent of said valve stem movement;

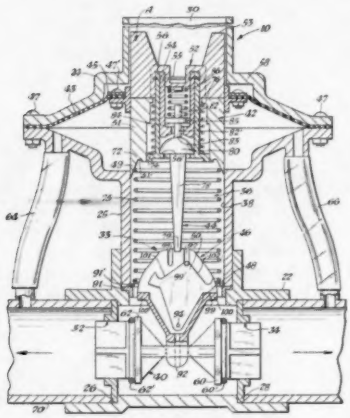
means operatively connected along said first end of said valve stem for biasing said second valve member against said by-pass port, and means for biasing said diaphragm assembly toward the first position of said valve stem, said valve body including a skirt defining said by-pass port and said diaphragm assembly biasing means including a substantially circular valve plate operatively connected to said first end of said valve stem and movable with said valve stem within the space enclosed by said skirt, said plate having a diameter substantially greater than said second valve member and defining a flow restriction with said skirt, said skirt having a canted interior wall by which air passing through said by-pass port is directed at said valve plate to strike said valve plate whereby the force of air striking said valve plate urges said valve stem toward its first said position and increasing air flow will overcome said vacuum to move said valve stem entirely to said second position.

4,178,954

DIAPHRAGM VALVE AND VALVE SYSTEM

Hal Klieves, 2830 NE. 29 Ave., Lighthouse Point, Fla. 33064

Filed Jun. 14, 1977, Ser. No. 806,354
Int. Cl.[2] F16K *31/363*
U.S. Cl. 137—119 **3 Claims**



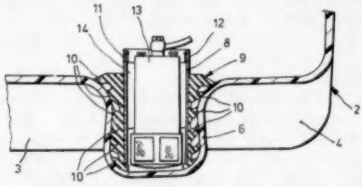
1. An automatic valve comprising:
a body having an upper and lower portion, said upper portion having a fluid inlet for receiving incoming fluid,
two separate fluid outlets in said lower portion fluidly connected to said fluid inlet for alternately distributing said fluid to outlet conduits,
an intermediate portion connecting said fluid inlet to said fluid outlets,
two separate hydraulic by-pass means including an aperture disposed through said lower portion, an aperture disposed through said outlet conduits and a conduit means connecting said apertures for fluidly connecting said intermediate portion to said outlet conduits downstream of said fluid outlets for the equalization of pressure between said intermediate portion and said outlet conduits,
a valve gating means movably connected to each of said fluid outlets for alternate engagement with said outlets for securing flow through said alternate fluid outlets, and
a cycling mechanism movably connected in said intermediate portion for distributing said incoming fluid out alternate fluid outlets and including,
a diaphragm separator means movable in said intermediate portion for sealing said aperture in said lower body portion flexibly connected to said body between said upper portion and said lower portion and movably responsive to fluid pressure of said incoming fluid for moving said diaphragm separator means to a first position to seal said aperture of said hydraulic by-pass means disposed through said lower portion, thereby preventing fluid from flowing through said by-pass means when fluid is flowing through said fluid inlet,
an actuating means for passing said inlet fluid from said upper body portion to said lower body portion movably connected to said diaphragm separator means responsive to movement of said diaphragm separator for passing said incoming fluid through said intermediate portion when said diaphragm separator means is in said first position while preventing fluid from flowing through said by-pass means , and
a cycling drive means for alternately moving said valve gating means into contact with said fluid outlets having a drive arm driven by and connected to said actuating means at a first end and a cam means having a base member for receiving a second end of said drive arm for imparting alternate motion to said cam means for alternately moving said valve gating means into and out of contact with said fluid outlets to allow alternate fluid flow to said outlet conduits.

4,178,955

VEHICLE FUEL TANK

Wolfram Dau, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,412
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727497
Int. Cl.[2] B65D *1/24*
U.S. Cl. 137—264 **5 Claims**



1. A vehicle fuel tank comprising a tank enclosure having a bottom wall, said bottom wall being formed with first and second indentations, said indentations being arranged to form an internal pocket within the tank between oppositely facing surfaces of said indentations, and a reserve tank, communicating with a fuel outlet line and mounted to said bottom in said pocket and clamped by its lower periphery between said oppositely facing surfaces.

4,178,956

SELF-DRAINING SILL COCK ASSEMBLY

Russell L. Fillman, Mitchellville, Iowa, assignor to Woodford Manufacturing Company, Des Moines, Iowa

Filed Apr. 3, 1978, Ser. No. 893,040
Int. Cl.[2] E03B *9/14*
U.S. Cl. 137—360 **14 Claims**

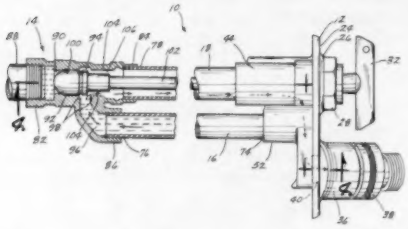
1. A self draining sill cock assembly comprising,
fluid outlet means adapted for disposition on an exterior wall,
fluid flow inlet means spaced remotely from said fluid outlet means and adapted for disposition adjacent an interior wall,
first conduit means having first and second ends connecting said fluid flow outlet means and said fluid inlet means in fluid communication, said first end being operationally

connected to said outlet means and said second end being operationally connected to said inlet means,

selectively operable valve means disposed adjacent said fluid inlet means and remote from said fluid outlet means, said valve means adapted to alternately open and close said inlet means to alternately permit and prevent fluid flow from said inlet means through said first conduit to said outlet means,

manually operable valve control means positioned remotely from said first conduit means, having first and second ends, said first end adapted for disposition on an exterior wall in separate and spaced relationship to said outlet means, said second end being operatively connected to said valve means to provide the selective manual operation of said valve means from an exterior wall remote from said valve means,

second conduit means having first and second ends operatively connected to said second end to said valve means to



provide selective fluid communication between said first conduit means and said second conduit means when said inlet means is closed by said valve means,

drain discharge means operationally connected to said first end of said second conduit means, said drain means adapted for disposition on an exterior wall adjacent said fluid outlet means,

said first and second conduit means being relatively disposed such that said first end of said first conduit means is vertically higher than said second end of said first conduit means and said first end of said second conduit means is vertically lower than said second end of said second conduit means and said second end of said first conduit means so that fluid will drain from said first conduit means, through said valve means, through said second conduit means and outwardly from said drain discharge means when said fluid inlet means is closed by said valve means and said valve means fluidly connects said first and second conduit means.

4,178,957

DISHWASHER FILL SYSTEM

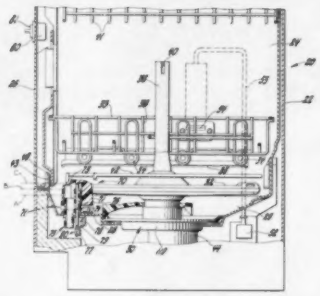
Robert E. Hoffman, Dayton; Richard B. Williams, Kettering, and Carl J. Wright, Bellbrook, all of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Nov. 20, 1978, Ser. No. 962,060

Int. Cl.[2] F16K *21/18;* **D06F** *39/08;* **B08B** *3/02*

U.S. Cl. 137—387 **2 Claims**

1. A water fill and cycle advance system for assuring a predetermined lesser rinse level of water and a greater wash level of water for a dishwasher having a sump for containing said levels, fill valve means adapted for normally supplying the wash level and rinse level of water from a domestic supply of water available at varying line pressures and a timer for controlling said fill valve means in a dishwashing cycle including sequential fill cycle portions for rinse fill and wash fill, said timer including a timer motor and a timer motor switch operable for selectively energizing and deenergizing the timer motor during either of said cycle portions to advance said dishwashing cycle through said cycle portions, said system including rinse fill and wash fill timer switches and a rinse level switch responsive to water level in said sump, said timer motor switch and said rinse fill timer switch adapted during either of said cycle portions to supply power for energizing said timer motor and being in shunt relation to each other so that said rinse fill timer switch may supply such power when said timer motor switch does not, said rinse level switch being in series circuit relation with said rinse fill timer switch and having a first position in series circuit relation with said fill valve means for energizing said fill valve means when water in said sump is below said rinse level and movable to a second position in series circuit relation with said timer motor for deenergizing said fill valve means when water in said sump is at said rinse fill level and for reenergizing said timer motor through said rinse fill timer switch to advance said dishwashing cycle through either of said cycle portions after said timer motor switch has



been selectively operated for deenergizing said timer motor, thereby assuring said rinse level irrespective of said line pressure and the operation of said timer motor switch and further assuring the advance of said dishwashing cycle when said rinse fill level has been assured, said wash fill timer switch being in series circuit relation with said fill valve means and in shunt with said rinse fill timer switch and said rinse level switch in its first position for energizing said fill valve means when water in said sump is above said rinse fill level, said wash fill timer switch being operable to supply power for energizing said fill valve means during said fill cycle portion for wash fill and inoperable to supply power for energizing said fill valve means during said fill cycle portion for rinse fill, thereby to supply less water for rinse during the fill cycle portion for rinse fill than for wash during the fill cycle portion for wash fill.

4,178,958

NON-RETURN DEVICES FOR WELDING INSTALLATIONS

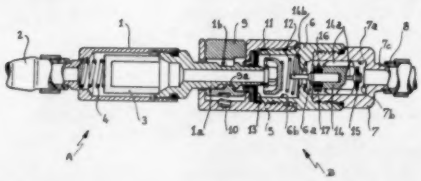
Joseph Palau, Duignt, France, assignor to Societe Anonyme des Etablissements Staubli, Faverges, France

Filed Feb. 15, 1978, Ser. No. 878,150

Claims priority, application France, Mar. 15, 1977, 77 08327

Int. Cl.[2] F16K *17/30*

U.S. Cl. 137—460 **3 Claims**



1. An improved non-return device for coupling the piping from a welding torch to a welding generator supplying gas under pressure, the device being of the type having a tubular

body having a bore therein communicating through an opening at an upstream end of the bore with said gas generator and communicating through an opening at a downstream end of the bore with said torch piping, and the device having a valve in the bore moveable by the flow of gas toward the upstream end to close the opening thereat in the case of backflow from the torch end, and the device having calibrated means for yieldably urging the valve away from the downstream end of the bore, the calibrated means being yieldable to permit the valve to close the opening at the downstream end of the bore in the case of excessive downstream flow of gas therethrough, the improvement wherein the tubular body comprises separable male and female elements coupling said torch piping and generator together when a portion of the male element is inserted and latched in position in the female element; and means dispoed in said body between the valve and said portion of the male element and actuated to displace the valve from said downstream end of the bore when said male portion is inserted further into the female element beyond said latched position.

4,178,959

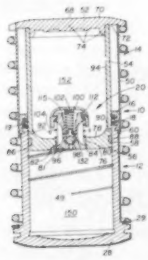
FLUID TRUCK SNUBBER

Richard C. Farris, Joshua, and William S. Butler, Burleson, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 679,620, Apr. 23, 1976, Pat. No. 4,106,412. This application Jun. 2, 1978, Ser. No. 912,125

Int. Cl.[2] F16K *17/18*

U.S. Cl. 137—493.3 **4 Claims**



1. A valve assembly for use in a shock absorber having a high pressure chamber and a reservoir chamber and a first passageway fluidly communicating the chamber and reservoir to control fluid flow through the first passageway, comprising:

first valve member means for opening and closing said first passageway, said valve member means having first end communicating with said high pressure chamber, a second end communicating with said reservoir chamber, an outwardly projecting seating shoulder adjacent said first end and facing said second end, a flange portion adjacent said second end, a plurality of external recesses extending between said flange portion and said seating shoulder, an inlet opening in continuous fluid communication with said high pressure chamber, an outlet opening in continuous fluid communication with said reservoir chamber, a second passageway fluidly communicating said inlet opening with said outlet opening and a valve seat within said passageway;

first biasing means for maintaining said seating shoulder in positions opening and closing said first passageway responsive to pressures in said high pressure chamber respectively not exceeding and exceeding the pressure in said reservoir chamber;

second valve member means, within said second passageway, for cooperating with said valve seat to open and close said second passageway;

second biasing means for maintaining said second valve member in positions opening and closing said second passageway in responsive to pressures in said high pressure chamber respectively exceeding and not exceeding the pressure in said reservoir by a predetermined amount.

4,178,960

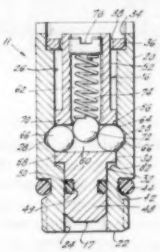
RESETTABLE PRESSURE RESPONSIVE VALVE

Joseph J. Napolitano, Paramus, and Michael Richardson, Paterson, both of N.J., assignors to Auto Research Corporation, Oakland, N.J.

Filed May 24, 1977, Ser. No. 801,201

Int. Cl.[2] F16K *31/12*

U.S. Cl. 137—494 **16 Claims**



1. A pressure responsive valve, comprising:

a cylinder having a longitudinally extending bore therethrough; one end of said cylinder bore being connectable to a pressure source;

a piston in said cylinder bore and movable therethrough;

detent means for retaining said piston at a predetermined longitudinal position along said cylinder bore; said detent means comprising:

a detent element on said piston; a detent element receiving recess in said cylinder bore; said detent element being shaped to be received in said recess while said detent element is also on said piston; a radially extending bore in said piston, in which said detent element is supported; said radially extending bore being registrable with said cylinder recess upon shifting of said piston to said predetermined longitudinal position; said detent element being in said radially extending bore at all times including when it is also in said recess;

a biasing element on and movable along with said piston; said biasing element being movable along a longitudinally extending axis of and with respect to said piston; said biasing element also being in engagement with said detent element and said biasing element normally urging said detent element radially outwardly of said radially extending bore and in a direction into said recess; said detent element being normally offset from said biasing element axis of longitudinal motion; said detent element and said biasing element both being respectively so shaped that longitudinal motion of said biasing element translates into radial motion of said detent element into and out of said recess, and radial motion of said detent element translates into longitudinal motion of said biasing element;

biasing means connected with said biasing element for normally urging said biasing element to move longitudinally with respect to said piston to contact said detent element and to urge said detent element into said recess; said biasing element and said detent element being placed to charge said biasing element as said detent element is moved out of said recess.

4,178,961
LUNG-CONTROLLED MEMBRANE VALVE FOR COMPRESSED GAS RESPIRATORS

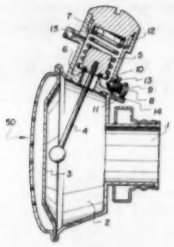
Ernst Warncke, Lübeck, Fed. Rep. of Germany, assignor to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,961

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646338

Int. Cl.[2] A62B *7/04*

U.S. Cl. 137—495 **4 Claims**



1. A lung controlled valve for compressed gas respirators, comprising a valve housing having a diaphragm chamber, a diaphragm extending across said chamber and being displaceable by pressure changes therein, a connecting piece for supplying breathing gas connected into said chamber on one side of said diaphragm, a valve member having a valve chamber with a pressure gas inlet, a valve seat in said valve chamber with an opening therein from said valve chamber to one side of said diaphragm chamber, a valve body enclosing said valve seat and shutting off the pressure gas flow into said one side of said diaphragm chamber, a tipping lever connected to said valve and extending through said valve opening into said one side of said diaphragm chamber in a position to be contacted by said diaphragm during displacement thereof to raise said valve and open said valve opening, a hand-operated lift off member mounted in said valve member for displacement into engagement with said valve body to lift it off said seat, including spring means biasing said valve to a closed position, said lift-off member comprising a push button having a conical end engageable with said valve body.

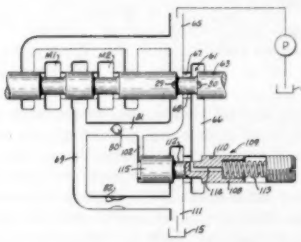
4,178,962
CONTROL VALVE WITH FLOW CONTROL MEANS

Francis H. Tennis, Oconomowoc, Wis., assignor to Tomco, Inc., Racine, Wis.

Filed Oct. 30, 1972, Ser. No. 302,594

Int. Cl.[2] F15B *13/02*

U.S. Cl. 137—596.13 **15 Claims**



8. A control valve of the type having an inlet, an outlet, a motor port for connection with a fluid motor, a valve spool movable in a bore from a neutral position to an operating position connecting the motor port with the inlet, and a bypass intersecting the bore and having an inlet portion upstream from the bore connecting with the inlet and an outlet portion downstream from the bore connecting with the outlet, said bypass providing for substantially unrestricted flow of fluid from the inlet to the outlet in the neutral position of the valve spool, and the latter being operable to close off communication between the inlet and outlet portions of the bypass in a full operating position of the spool, wherein the improvement comprises:

A. bypass restricting means rendered effective in a partial operating position of the spool to limit fluid flow through the bypass so as to thereby divert to the motor port a metered amount of fluid from the inlet and to create a differential in pressure between the inlet and outlet portions of the bypass;

B. and a flow control mechanism having fluid pressure responsive valve means to restrict and regulate fluid flow to the outlet from said outlet portion of the bypass in accordance with variations in the pressure differential between the inlet and outlet portions of the bypass in said partial operating position of the valve spool.

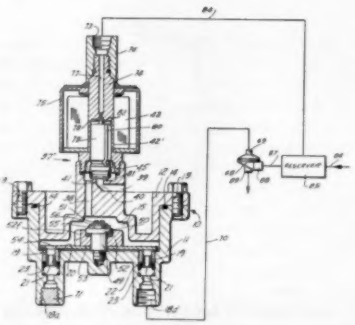
4,178,963
PILOT OPERATED SEQUENCING VALVE

Roger G. Riefler, Kinnelon, and Alfred Rolfe, Pottersville, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Apr. 14, 1978, Ser. No. 896,257

Int. Cl.[2] F16K *11/02*

U.S. Cl. 137—624.18 **14 Claims**



1. A valve for sequentially operating a plurality of main valves, comprising:

(a) a valve body having a plurality of inlet ports for connection to a plurality of main valves, respectively,

(b) a chamber within said valve body for receiving high pressure fluid from said inlet ports,

(c) a pilot valve for selectively permitting or preventing communication between said chamber and a low pressure region, so that when said pilot valve is open the pressure in said chamber is relieved and when said pilot valve is closed the pressure in said chamber increases,

(d) sequencing valve means including a movable member for permitting only one of said inlet ports to be in communication with said chamber each time said pilot valve is opened, so as to relieve pressure in only the main valve connected to that one inlet port,

(e) operator means for indexing said movable member from one stationary position to another upon each closure of said pilot valve and resulting increase in pressure in said chamber, and

(f) said movable member having an aperture through which a different one of said inlet ports communicates with said chamber in each stationary position of said movable member, said inlet ports being spaced apart along the path of movement of said aperture, and the length of said aperture being greater than the shortest distance between each two

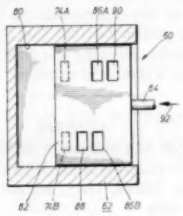
successive inlet ports measured along the path of movement of said aperature, so that at all times at least one of said inlet ports communicates with said chamber through said aperture.

4,178,964

DOUBLE VALVE MECHANISM FOR CONTROLLING FLUID FLOWS

Marvin L. Moore, 16204 Diana La., Apt. 323A, Houston, Tex. 77062; Karen H. Moore, 4520 Duval, Apt. 203, Austin, Tex. 78751, and William M. Moore, 8820 Mountain Path Cir., Austin, Tex. 78750

Filed Oct. 22, 1976, Ser. No. 734,829
Int. Cl.[2] F16K *11/06, 11/20*
U.S. Cl. 137—625.4 **9 Claims**



1. A flow control apparatus comprising:

a casing adapted for interconnection in a fluid flow conduit;

an upstream partition mounted within said casing, said upstream partition having a rectangular orifice therein said rectangular orifice having a flow cross section area less than the flow cross section of said conduit;

a downstream partition mounted within said casing, said downstream partition having a rectangular orifice therein, said rectangular orifice having a flow cross section area less than the flow cross section of said conduit yet larger than the flow cross section of said orifice in said upstream partition;

said upstream and said downstream partitions cooperating with said casing to define a separate valve plate chamber; and,

a valve plate slidably moveable within said valve plate chamber from a first, closed, to a second open, position, said valve plate having a rectangular passage therein, said passage having a flow cross section substantially equal to the flow cross section of said rectangular orifice in said downstream partition;

means for moving said valve plate from the first to the second position within said valve plate chamber;

said valve plate in said first, closed, position blocking communication between said rectangular orifice in said upstream partition and said rectangular orifice in said downstream partition,

said rectangular passage in said valve plate registering with said orifice in said upstream partition and said orifice in said downstream partition when said valve plate is in said second, open, position, with the axes of each of said orifices and said passage being in parallel relationship when said valve plate is in the open position;

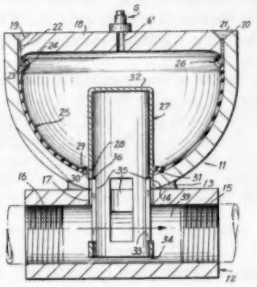
movement of said valve plate within said valve plate chamber in response to said moving means disposing said rectangular orifice in said valve plate chamber in fluid communication with said rectangular orifice in said downstream partition before said passage in said valve plate is in fluid communication with said rectangular orifice in said upstream partition to thereby minimize direct fluid impingement on said partition about said downstream orifice as said valve plate moves from said first, closed, to said second, open, position.

4,178,965

PULSATION DAMPENER DEVICE

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Dec. 4, 1978, Ser. No. 966,518
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—30 **5 Claims**



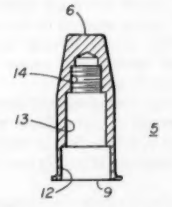
1. A pulsation dampener device comprising, in combination, a pressure vessel including an axially directed cylindrical oil port at one end and a top abutment member at the other end in spaced relation to said oil port, said abutment member including a gas charging valve, a liquid flow conduit member fixed to said vessel below said oil port, said conduit member including an orifice adjacent said oil port, said orifice and oil port being in registry and defining an axially elongated vertical bearing surface, a cylindrical actuator sleeve closed at its upper end and slidably guided in said bearing surface for axial movement relative to said vessel between a lower limiting position wherein a shank portion adjacent the lower end of said sleeve projects into said conduit, and an upper limiting position whereat said upper end of said sleeve is disposed adjacent said abutment member and parts of said shank portion are disposed within said vessel, a plurality of apertures formed in said shank portion of said sleeve, said apertures, in said lower limiting position being below the level of said oil port, and a resilient, elastomeric bladder member mounted in said pressure vessel and dividing the same into two chambers, said bladder member including an upper portion surrounding said gas charging valve, and a lower portion secured to said sleeve at a position above the level of said apertures.

4,178,966

TUBE PLUG

Dennis E. Savor, Hixson, Tenn., and Roderick G. Rohrberg, Torrance, Calif., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 13, 1978, Ser. No. 876,958
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—89 **2 Claims**



1. A metallic plug body to be seal-welded in the end of a tube which tube extends through and is welded to a tubesheet, the plug body having,

a generally cylindrical and bullet-shaped form which is tapered on the first end to be inserted into the tube to which the body is to be seal-welded and which is sized from the second end to have a clearance fit with the wall of the tube hole,

a first bore formed from the second end with a diameter which provides a wall with a predetermined flexure,

a second bore formed from the second end as a counterbore to the first bore to provide a cylindrical bearing area for the mandrel of a welding machine which seal-welds the plug to the tube,

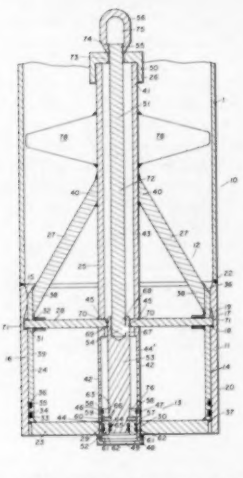
and a flange on the second end and formed to flare from the outside wall of the plug body in a radius which matches the radius which is spot faced at the weld zone on the entrance to the tube hole to be plugged in forming a positive stop limitation to the plug body as it is inserted into the tube while the flange also provides filler material at the weld zone between the plug body and the tube.

4,178,967

RETRIEVABLE PLUG FOR OFFSHORE PLATFORMS

Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 14, 1978, Ser. No. 942,255
Int. Cl.[2] F16L *55/10*
U.S. Cl. 138—89 **18 Claims**



1. A plug for sealing the interior of a hollow cylindrical member to prevent the flow of fluid therethrough, said plug comprising:

a central body member releasably secured to said hollow cylindrical member in sealing engagement with the interior surface of said hollow cylindrical member, said central body member including:

circular plug means having a central opening therein;

annular wall means secured to the outer periphery of said circular plug means having aperture means located therein and having seal means located in the outer surface thereof; and

cylindrical body means secured about the periphery of the central opening of said circular plug means having first and second aperture means therein, said second aperture means therein allowing the flow of said fluid therethrough;

retractable retaining means for releasably securing said central body member to said hollow cylindrical member; and

pressure equalization means for allowing the pressure of said fluid to equalize across said central body member before the removal thereof from said hollow cylindrical member to allow the flow of said fluid through said hollow cylindrical member, said pressure equalization means including:

sleeve means releasably secured within said cylindrical body means of said central body means in sealing engagement therewith;

plug means releasably secured to said sleeve means in sealing engagement therewith; and

rod means secured to said plug means to initially release said sleeve means from said cylindrical body means and subsequently release said plug means from said sleeve means when a force is applied to said rod means

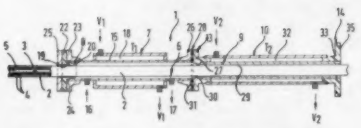
whereby the sleeve means are released from sealing engagement with said central body means by applying a first force to the rod means therby allowing the flow of said fluid through said hollow cylindrical member and the plug means are released from sealing engagement with the sleeve means by subsequently applying a second force to the rod means, the second force having a magnitude greater than the first force applied to the rod means thereby allowing the removal of said plug from said hollow cylindrical member.

4,178,968

PROCESS FOR MANUFACTURING REINFORCED ELASTOMERIC HOSES AND RESULTANT PRODUCT

Angioletti, Attilio, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed May 27, 1977, Ser. No. 801,212
Claims priority, application Italy, Jun. 4, 1976, 23928 A/76
Int. Cl.[2] B29C *25/00;* **F16L** *11/08*
U.S. Cl. 138—126 **11 Claims**



1. A process for vulcanizing a hose of elastomeric material provided with a reinforcing structure embedded in its wall comprising the steps of smoothing and completely vulcanizing the external surface of the hose while all the elastomeric material of the hose itself is substantially mantained in an uncured state, and subsequently vulcanizing the remaining uncured elastomeric material forming said hose.

11. Reinforced flexible hose made from elastomeric material by the process of claim **1**.

4,178,969

SYSTEM AND METHOD FOR CONTROLLING THE STOPPING OPERATIONS OF WEAVING MACHINES

Miyuki Gotoh, Tokorozawa, and Mikiyoshi Ogawa, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

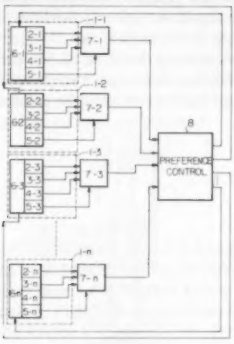
Filed Aug. 24, 1978, Ser. No. 936,191
Claims priority, application Japan, Sep. 5, 1977, 52-105876
Int. Cl.[2] D03D *51/00*
U.S. Cl. 139—1 R **7 Claims**

1. A system for controlling the sequence of stopping operations of a plurality of weaving machines during emergency conditions to minimize the loss of time due to the stoppage, comprising:

first and second detectors associated with each one of said weaving machines for generating high and low priority emergency signals respectively when the associated weaving machine is under an emergency condition of high or low priority; and

preference controlling means for activating a brake actuator of the associated weaving machine in response to the presence of said high priority emergency signal and to the presence of said low priority emergency signal in the

absence of high priority emergency signal generated from the detector associated with another weaving machine and activating said brake actuator after the elapse of a



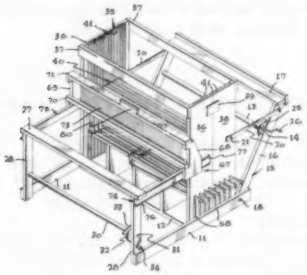
predetermined period of time in response to said low priority emergency signal in the presence of said another high priority emergency signal.

4,178,970

HAND LOOM

William F. Mueller, Tarzana, Calif., assignor to Christine E. Mueller, Tarzana, Calif.

Filed May 1, 1978, Ser. No. 901,355
Int. Cl.[2] D03D *29/00*
U.S. Cl. 139—30 **15 Claims**



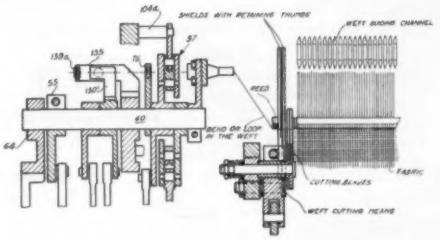
1. In a hand loom having a frame, a warp beam at the rear of the frame, a cloth beam at the front of the frame, a vertically extending castle intermediate the warp beam and the cloth beam in which a plurality of harnesses are mounted for vertical reciprocation and a beater disposed in front of the harnesses, the improvement wherein the harnesses comprise a narrow, rigid generally rectangular frame having laterally spaced parallel side members joined by vertically spaced parallel top and bottom members with the lateral surfaces of the bottom member being twisted at right angles to the lateral surfaces of said side members and have vertically spaced parallel upper and lower heddle bars slidably mounted in and extending between said side members parallel and adjacent to the inner confronting faces of said top and bottom members for carrying a plurality of heddles, said upper and lower heddle bars extending beyond said side members and being adapted to be received in aligned vertical channels provided in the inner confronting surfaces of the castle members, and lever means pivotally mounted for rotation beneath each harness about a horizontal axis longitudinal of the frame, said lever means comprising an elongated arm having an integral upstanding leg at its inner end portion which is in communication with the bottom member of said harness, said leg having a width no greater than the width of said harnesses, and an outer portion extending exterior of the castle, whereby when the said outer portion of the lever means is depressed, the upstanding leg at the inner end portion of the lever means is pivotally moved upwardly and laterally to thereby raise the harness beneath which the said lever means is mounted, the lever means mounted beneath the forward harness of the loom being adapted to raise such harness a sufficient distance to provide an ample shed and the lever means mounted beneath each successive harness being adapted to raise each successive harness a short distance higher than the preceding harness.

4,178,971

METHOD OF AND APPARATUS FOR INSERTING WEFT THREADS INTO A JET LOOM

Jaromir Malasek, Brno; Vladimir Kuda, Blazovice, and Miroslav Bucek, Brnenske Ivanovice, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 826,715, Aug. 22, 1977, abandoned. This application May 24, 1978, Ser. No. 909,344
Claims priority, application Czechoslovakia, Aug. 24, 1976, 5479/76
Int. Cl.[2] D03D *47/30*
U.S. Cl. 139—435 **7 Claims**



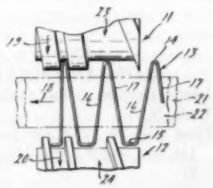
1. A method of controlling weft threads in jet looms which operate with alternation of insertion of different first and second weft threads, comprising the following steps in the order named: opening a first shed of the loom, inserting the first weft thread into the first shed, beating up the inserted first weft thread, closing the first shed, retaining the inserted first weft thread in uncut condition under tension, opening a second, subsequent shed, inserting the second weft thread into the second shed, beating up the inserted second weft thread, retaining the inserted second weft thread under tension, and cutting off the first weft thread.

4,178,972

MACHINE FOR MANUFACTURING ZIG ZAG WIRE BINDERS

Ernst Pfaffle, Neuffen, Fed. Rep. of Germany, assignor to Hans Sickinger Co., Pontiac, Mich.

Filed Aug. 14, 1978, Ser. No. 933,677
Int. Cl.[2] B21F *45/16*
U.S. Cl. 140—105 **3 Claims**



1. A wire binder forming machine comprising a pair of companion die rolls for receiving the oppositely facing bends

of a wire with a preliminary zig zag formation, the groove on each die roll having a helical configuration with a first section of progressively decreasing width and a second section of constant width, the groove side walls of the first section being initially spaced apart a substantially greater distance than the size of the wire bend received therein and progressively narrowing down to approximately the size of the wire bend, the second section having side walls spaced apart approximately the size of the wire bend received therein so as to avoid substantial friction thereon, and a projection formed on at least one side wall of each groove at the juncture of said first and second sections, the size of said projection being such that when it reaches the wire bend it will impact the bend to bring the wire legs extending from the bend closer together.

4,178,973

TOOL FOR APPLYING BUNDLE TIES

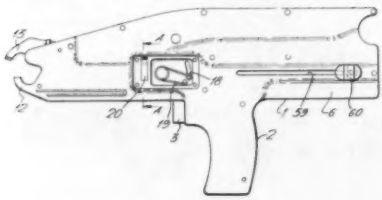
John C. Collier, Southport, and Leonard J. Owen, Watford, both of England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 23, 1978, Ser. No. 936,261

Claims priority, application United Kingdom, Sep. 6, 1977, 37098/77

Int. Cl.[2] B21F *9/02*

U.S. Cl. 140—123.6 **3 Claims**



1. A tool for applying bundle ties of the kind having a flexible strap portion formed at one end with an apertured frame for passage of the other free end of the strap, the tool comprising a tool frame reciprocably supporting a carriage in a rectilinear guide path leading to a loop guide at a forward end of the guide path, the tool including means for positioning a tie longitudinally in the guide path between the carriage and the loop guide with the tie frame adjacent the carriage, the loop guide being adapted releasably to embrace material to be bundled and defining a concave guide path arranged to engage the leading end of a strap portion driven forwardly by the carriage and to deflect the strap around the concave guide path and back into the rectilinear guide path, releasably gripping means at the carriage for gripping the reversed leading end of the strap portion, and a shear device operable transversely of the rectilinear guide path, disposed at the forward end of the frame rearwardly of the loop guide, characterised by means for reciprocating the carriage comprising a drive rod **5** extending rearwardly from the carriage **26** and slidably mounted in the tool frame **1**, a handle **60** projecting laterally from the rod **5** through a slot **59** in the frame **1**, and a trigger **3** mounted at a handle **2** of the tool frame **1** coupled to the rod **5** by a clutch device **4** operable to drive the rod **5** rearwards on pulling the trigger **3**.

4,178,974

FLOW CONTROLLER

Jonathan S. Levin, Levittown, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,751

Int. Cl.[2] B65B *3/36, 3/12, 31/00*

U.S. Cl. 141—51 **2 Claims**

1. In combination:

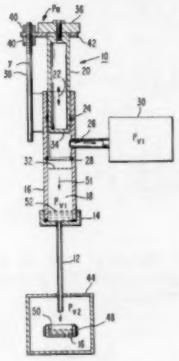
a fluid reservoir cylinder containing a liquid;

an evacuated chamber;

a hollow conduit between the reservoir and chamber in communication with the liquid, the hollow in the conduit being of sufficiently small cross section that pressure is required to cause said liquid to flow through said conduit;

means including a piston in the cylinder for applying pressure to the liquid for forcing the liquid through the conduit and into the chamber; and

means for terminating the flow of liquid comprising means for concurrently removing the pressure applied to the liquid and means for reducing the pressure in the reservoir



over the fluid to the same value as is present in the chamber, said means for reducing the pressure comprising evacuation means connected to said cylinder at a point such that said piston operates to block the path between said evacuation means and said cylinder when the piston is applying pressure to said liquid and said piston opens the path between the two when the piston is moved more than a given distance away from the fluid.

4,178,975

DISPENSING DEVICE ACTUATED BY A RECEIVING MEMBER

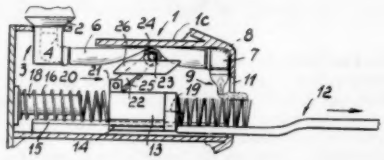
Carlo Crespi, Via Bertinoro, 9, Milano, Italy

Filed Oct. 18, 1977, Ser. No. 843,109

Claims priority, application Italy, Aug. 30, 1977, 27080 A/77

Int. Cl.[2] B65D *35/40, 35/56*

U.S. Cl. 141—362 **3 Claims**



1. A dispensing device for paste-like material, particularly toothpaste, comprising a housing, an opening in said housing, a container of said material secured to said housing, a delivery mouth proximate to said opening for dispensing a controlled amount of said material on a receiving member like a toothbrush when inserted into said housing through said opening, an elastically deformable duct between said container and said delivery mouth in air-tight connection therewith, a carriage slidable substantially parallel to said duct and operable by said receiving member to move substantially parallel to said duct together with said receiving member when said receiving member is introduced into said housing through said opening, a squeezing member journaled to said carriage and resiliently urged toward said duct, cams arranged in the path of said squeezing member for causing said squeezing member to move spaced from said duct when said receiving member is moved

within said housing in engagement with said carriage away from said opening and to progressively squeeze said duct toward said delivery mouth when said receiving member is moved within said housing together with said carriage toward said opening to dispense a controlled amount of said material onto said receiving member while simultaneously sucking a substantially equal amount into said duct from said container, and resilient means for urging said carriage toward said delivery mouth during delivery of said material.

4,178,976

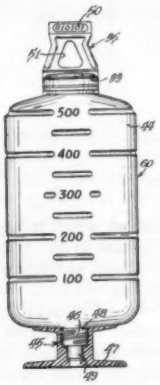
UNITARY, HERMETICALLY-SEALED BUT PIERCEABLE DISPENSING CONTAINER

Gerhard H. Weiler, South Barrington; Dieter H. Nagel, Des Plaines, and Louis T. Pagels, Hanover Park, all of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

Division of Ser. No. 876,730, Feb. 10, 1978. This application Oct. 16, 1978, Ser. No. 951,568

Int. Cl.[2] B65D *1/02*

U.S. Cl. 150—0.5 **15 Claims**



1. A unitary, hermetically-sealed but pierceable dispensing container, suitable for containing parenteral solutions, which comprises

a flexible, generally tubular body of thermoplastic material, closed at one end and terminating at the other end in a draining region provided with an annular sealing means unitary with said tubular body and defining an access aperture, and a pierceable membrane hermetically occluding the aperture and being unitary with said sealing means;

said membrane being sufficiently thin to permit penetration by a cannula without coring, and said annular sealing means being adapted to receive the cannula in a sealing, frictional engagement when the membrane has been penetrated.

4,178,977

LAWNMOWER COVER

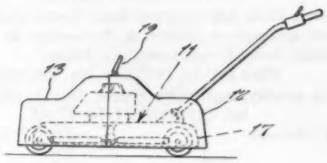
Ferdinand Sur, and George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y.

Filed May 12, 1978, Ser. No. 905,473

Int. Cl.[2] B65D *85/68*

U.S. Cl. 150—52 R **2 Claims**

1. A lawnmower cover, comprising in combination, two molded plastic shells that interslide together adjustably to fit over different sized mowers, a pair of inward extending lips on opposite lower edges of said cover, one said lip being on each



said shell, for anchoring under edges of a housing of said mower.

4,178,978

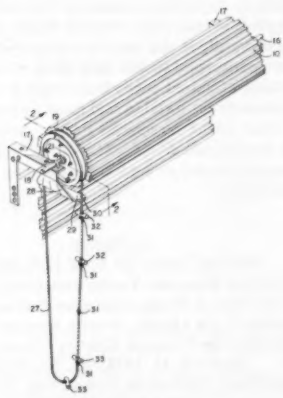
MANUAL OPERATOR FOR COILING DOOR

Peter B. Burnham, Columbus, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jun. 26, 1978, Ser. No. 919,293

Int. Cl.[2] A47G *5/02;* **E06B** *9/08*

U.S. Cl. 160—321 **1 Claim**

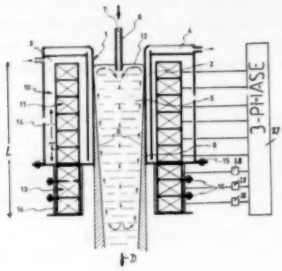


1. A manual operator for a coiling door including spaced brackets secured adjacent the top of the door opening, a shaft fixed to said brackets; drums rotatably mounted on said shaft and a coiling door having an edge secured to said drums comprising a reel rotatably mounted on said shaft adjacent one of said brackets; means for securing said reel to the adjacent one of said drums; an endless flexible non-extensible element, opposite ends for said element secured to said reel, a plurality of turns of said element on said reel, guide means directly secured to said bracket adjacent said reel and underlying said reel for guiding said element onto and off of said reel and a plurality of spaced stops on said element and a plurality of manually grasped grips slidably mounted on said element for engagement with said stops whereby when said element is manually pulled in one direction rotation of said reel opens said door and when said element is manually pulled in the other direction opposite rotation of said reel will close said door.

4,178,979
METHOD OF AND APPARATUS FOR ELECTROMAGNETIC MIXING OF METAL DURING CONTINUOUS CASTING

Jean-Pierre Birat, Algrange, and Roger Ventavoli, Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Jul. 13, 1977, Ser. No. 815,416
Claims priority, application France, Jul. 13, 1976, 76 21577
Int. Cl.[2] B22D *11/10, 27/02*
U.S. Cl. 164—49 **10 Claims**



1. A method of continuously casting a metal having a conductivity γ in 1/ohm-meter comprising the steps of:

continuously pouring said metal in molten condition into the top of a vertically tubular mold to form therein a descending column of said metal;

continuously cooling said mold to harden the periphery of said column;

continuously displacing a magnetic field having an effective strength B in tesla and a vertical length L in meters vertically upwardly in said mold at a propagation velocity v in meters per second to mix said metal in said mold;

establishing a desired subsurface depth d in millimeters of inclusions in the metal in said mold by setting the numerical values of the parameters B, L, γ, and v in accordance with the formula $B^2 \times L = (1/\gamma v)(16d^2 + 120d)$; and

continuously withdrawing a cooled casting from the bottom of said mold.

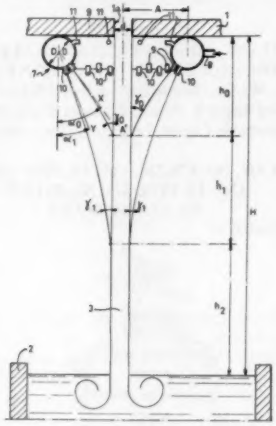
4,178,980
PROTECTION OF MOLTEN METAL

Ghislain Gilbert, Bures-sur-Yvette; Jean Galey, Voisins Bretonneux, and Gérard Bentz, Elancourt-Trappes, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Sep. 15, 1978, Ser. No. 942,532
Claims priority, application France, Sep. 22, 1977, 77 28561
Int. Cl.[2] B22D *21/02*
U.S. Cl. 164—66 **7 Claims**

1. A method of protecting a stream of molten metal of substantially circular cross-section and of a mean diameter d, which flows vertically, over a height H, between an upper supply container and a lower receptacle, by means of a liquefied inert gas which is distributed by an apparatus comprising a phase-separating member of annular form which surrounds the stream and which is intended to supply on the one hand the gaseous phase to form an atmosphere which envelops the upper part of the stream and on the other hand the liquid phase to form a substantially conical layer converging towards the stream, which it meets at an angle α, which method consists in that, with d greater than 40 mm and H greater than 900 mm, said liquid phase is distributed in the form of at least two layers, the upper layer meeting said stream of metal at a distance h_o which is not greater than 300 mm from the bottom of said upper supply container, each layer forming with said stream an angle γ which is not greater than 30° and being intended to protect a proportion of the vertical extent of the stream h not greater than 600 mm.

3. Apparatus for protecting, by means of liquefied inert gas, a vertical stream of molten metal of substantially circular cross-section and of a mean diameter d which flows vertically, over a height H, between an upper supply container and a lower receptacle, of the kind comprising a phase-separating member of annular form which is adapted to surround said stream and which is provided with injectors which supply on the one hand a gaseous phase, which forms an inert atmosphere enveloping the upper part of the stream, and on the other hand a liquid phase, which forms a substantially conical layer converging towards said stream which it meets at an angle γ, wherein said apparatus consists in that, with d greater than 40 mm and H greater than 900 mm, said separator has at least two tiers of injectors for injecting said liquid phase which tiers are regularly distributed in two superimposed circles each situated in a single horizontal plane, the injectors in said upper tier forming an angle α_o with the vertical such that the layer emerging from said upper tier meets the stream of metal at a height h which is not greater than 300 mm from the bottom of said upper container while each of said lower tiers forms an angle α_1, α_2, etc. with the vertical such that each layer meets said stream at an angle γ_o, γ_1, γ_2, etc. less than 30°.



4,178,981
COPPER CASTING METHOD USING TITANIUM DIOXIDE RELEASE METHOD

Edward C. Murray, Edmond, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 29, 1978, Ser. No. 920,466
Int. Cl.[2] B22C *3/00*
U.S. Cl. 164—72 **9 Claims**

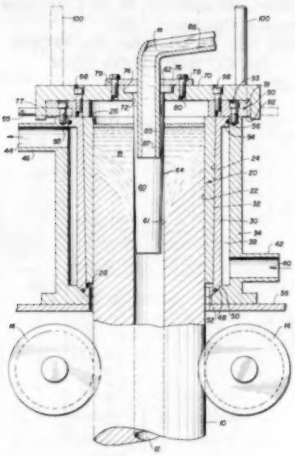
1. In the casting of copper in a mold wherein, the internal surface of the mold initially is coated with a release material slurried in a liquid medium, the mold then is filled with molten copper, and thereafter cooled and solidified copper is removed from the mold, the improvement which comprises utilizing as the release material a material consisting essentially of titanium dioxide in a particulate form having a particle size in the range of from about 0.1 micron to about 200 microns.

4,178,982

METHOD AND APPARATUS FOR CONTINUOUSLY CASTING HOLLOW BARS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed Oct. 28, 1977, Ser. No. 846,423
Int. Cl.[2] B22D *11/04*
U.S. Cl. 164—85 **12 Claims**



12. In the process of continuously casting hollow bars from a female die having an internal through passage, and a mandrel extending longitudinally in said passage of the female die and spaced from internal surfaces of the female die to define a forming chamber; the method of installing and locating the mandrel in a predetermined position within the passage of the female die during a casting operation comprising the steps of; mounting the mandrel to a mandrel support member having guide apertures on opposite end portions thereof, providing guiding pins vertically upstanding from the upper end of the female die, placing the mandrel support member on the guide pins with the guide pins received in the apertures of the mandrel support member, and grasping the mandrel support member and moving the mandrel support member downwardly towards the female die under the guidance of said guide pins to force the mandrel through molten metal in the female die to position the mandrel within the female die.

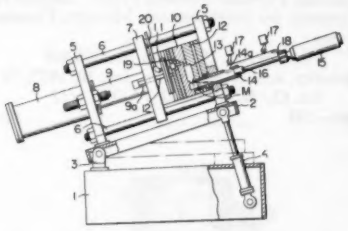
4,178,983

METHOD FOR MANUFACTURING STAINLESS STEEL DIE CAST PRODUCTS HAVING LOW MELTING POINT

Zenichi Mochizuki, Fuji; Yasuo Sugiura, Numazu, and Nobuo Kashiwagi, Nagaizumimachi, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 945,886
Claims priority, application Japan, Sep. 29, 1977, 52/117174
Int. Cl.[2] B22D *27/10*; C22C *38/42, 38/44, 38/54*
U.S. Cl. 164—113 **1 Claim**

1. A method for manufacturing a stainless steel die cast product having low melting point comprising the step of die casting an alloy consisting of 0.01–0.1% by weight of carbon, 1.0–3.0% by weight of silicon, 1–12% by weight (but excluding 3–7% by weight) of manganese, 8–25% by weight of nickel, 16–20% by weight of chromium, 1.5–2.5% by weight of copper 0.2–0.7% by weight of boron, 0.5–2.0% by weight of molybdenum and the balance of iron into a metal mold made of a tungsten alloy or a molybdenum alloy and maintained at a temperature of 250°–450° C. under conditions of a casting temperature higher than the liquid phase temperature of the



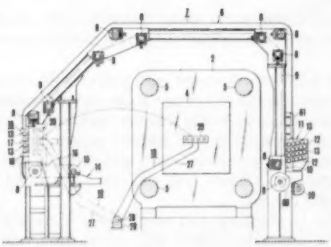
molten alloy by 100°–150° C., an injection pressure of 200–500 kg/cm^2, and an injection plunger speed of 0.2–1.0 m/sec.

4,178,984

APPARATUS FOR SUPPLYING INSERTS TO THE METAL MOLD OF INJECTION MOLDING MACHINES

Tatsuo Ishikawa, Ube, Japan, assignor to Ube Industries, Japan

Filed Jul. 6, 1978, Ser. No. 922,293
Int. Cl.[2] B22D *17/24, 17/32*
U.S. Cl. 164—333 **6 Claims**



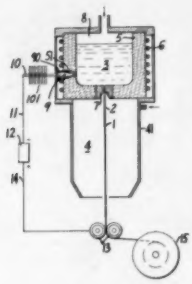
1. Apparatus for supplying inserts to a metal mold of an injection molding machine comprising an inverted U-shaped frame which straddles said injection molding machine, a chain conveyor extending along said frame, drive means for intermittently driving said chain conveyor, means provided on working side of said frame for supplying the inserts to said chain conveyor, means provided on the opposite side of said frame for transferring the inserts to insert holding means from said chain conveyor, and means for mounting the inserts transferred to said insert holding means into said metal mold, wherein said chain conveyor is provided with a plurality of L-shaped insert carriers, and said insert supply means comprises a chute containing a plurality of inclined plates on which cylindrical inserts roll into said insert carriers, wherein a predetermined number of said insert carriers are grouped and are spaced apart a predetermined pitch along the length of said chain conveyor, and wherein said insert transfer means comprises a plurality of insert receiving rods which are disposed in a predetermined pattern corresponding to that of the inserts when they are disposed in said metal mold and means for simultaneously moving said insert receiving rods into cylindrical inserts.

4,178,985

INSTALLATION FOR MANUFACTURING A METAL WIRE BY CONTINUOUS CASTING

Philippe Sauvage, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Dec. 29, 1977, Ser. No. 865,608
Claims priority, application France, Jan. 10, 1977, 77 00667
Int. Cl.[2] B22D *27/02, 11/00, 11/12*
U.S. Cl. 164—250 **13 Claims**



1. An installation for manufacturing wire by projecting a jet of electrically conductive molten metal through a die and subsequently through a cooling devie, said installation comprising:

a crucible adapted to contain molten metal and formed of an electrically insulating refractory material, said crucible being equipped with a heating device and provided with at least one passageway extending through a wall of said crucible;

a die for forming wire, associated with said crucible, and adapted to shape molten metal received from said crucible;

a closure member associated with said crucible to define an enclosure adapted to contain a gas under pressure;

means associated with said closure member for providing gas under pressure to said defined enclosure;

a cooling device associated with said crucible and said die and located to receive and cool said shaped metal exiting from said die and

means for establishing and maintaining electrical contact with the metal throughout the manufacture, comprising:

(a) at least one hot piece, said hot piece being a conductor of heat and electricity, provided in said at least one passageway and sized so as to create a gap between said hot piece and walls defining said at least one passageway, said hot piece including two ends, one end of which extends at least to an interior wall of said crucible;

(b) means associated with said hot piece to cool said hot piece, said means to cool said hot piece being located to cool the other end of said hot piece remote from said end which extends at least to said interior wall of said crucible causing said hot piece to function as a heat sink to solidify molten metal which has entered said gap to produce a gas-and-metal-tight seal;

(c) a source of electrical current;

(d) means associated with said source and attaching one pole of said source with hot piece;

(e) means associated with said hot piece for holding said hot piece immobile with respect to said crucible against the pressure created by the presence of any pressurized metal in said crucible;

(f) at least one cold piece, said cold piece being a conductor of electricity, connected to another pole of said source of electricity and of a shape and arrangement suitable for assuring electrical contact with said shaped metal; and

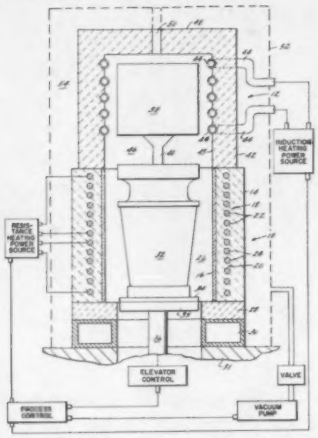
(g) means provided between said hot piece and said cold piece to electrically insulate said hot piece from said cold piece.

4,178,986

FURNACE FOR DIRECTIONAL SOLIDIFICATION CASTING

Russell W. Smashey, Albuquerque, N. Mex., assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 31, 1978, Ser. No. 892,434
Int. Cl.[2] B22D *25/00, 27/04*
U.S. Cl. 164—251 **1 Claim**



1. In a directional solidification melting and self-casting apparatus of the withdrawal type including a furnace, means to supply electric power to the furnace, means to control the electric power to control heat within the furnace, means to move a mold into and out of the furnace and means to maintain desired atmospheric conditions within the apparatus, the furnace being of a multi-zone, enclosed, insitu charge melting and self-casting type comprising, in combination:

a resistance heated zone; and

an induction heated zone;

the resistance heated zone being a directional solidification casting furnace including:

(a) resistance heated walls having an inner surface which defines a lateral boundary of a resistance heated hollow interior,

(b) a stationary chill disposed peripherally substantially vertically beneath said walls,

(c) a peripherally disposed radiation baffle disposed between said walls and said stationary chill, and

(d) a platform disposed axially within the apparatus and movable vertically and adapted to carry a casting mold into which molten metal is disposed;

the improvement wherein:

the induction heated zone is disposed above, aligned with and communicates directly with the resistance heated zone to define the resistance heated zone as a lower zone and the induction heated zone as an upper zone,

the upper zone including:

(a) upper walls having an inner surface enclosing an upper hollow interior substantially vertically aligned and coextensive with the resistance heated hollow interior and carrying at said inner surface an open bottom induction heating coil about the periphery of the upper hollow interior the inner surface of the resistance heated walls and the inner surface of the upper walls defining a substantially continuous inner furnace wall adapted to be in close proximity to lateral walls of the casting mold carried by the platform, and

(b) a furnace top member disposed across the upper walls

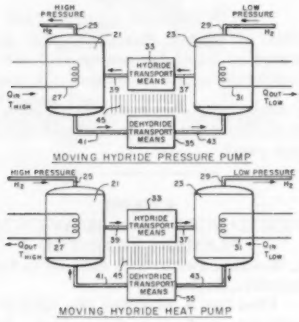
and upper hollow interior to define an upper boundary of the hollow interior.

4,178,987

MOVING BED HYDRIDE/DEHYDRIDE SYSTEMS

Walker H. Bowman, St. Charles, and Bruce E. Sirovich, Naperville, both of Ill., assignors to Standard Oil Company, a corporation of Indiana, Chicago, Ill.

Filed Jul. 12, 1978, Ser. No. 923,805
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 **40 Claims**



1. An apparatus for cycling a hydride-forming material between a first temperature and a second temperature comprising:

a plurality of reaction zones for containing the hydride-forming material, said plurality including first and second reaction zones;

means for supplying heat at the first temperature to the first reaction zone to promote the desorption of hydrogen from hydride-forming material in the first reaction zone;

means for supplying hydrogen to the second reaction zone;

means for removing hydrogen from the first reaction zone;

means for removing heat at the second temperature from the second reaction zone to promote the absorption of hydrogen by hydride-forming material in the second reaction zone;

transport means including first means for transporting hydride-forming material which has been at least partially dehydrided in the first reaction zone from the first reaction zone to the second reaction zone;

second means, included in the transport means, for transporting hydride-forming material which has been at least partially hydrided in the second reaction zone from the second reaction zone to at least one other reaction zone, said first and second means cooperating to cycle hydride-forming material between the first and second reaction zones while permitting the first and second reaction zones to be maintained at substantially constant temperature.

9. A method for thermally cycling a hydride-forming material between a first temperature and a second temperature in a hydride pump, said pump including a plurality of reaction zones comprising first and second reaction zones, wherein the method comprises the following steps:

supplying heat at the first temperature to hydride-forming material in the first reaction zone to promote desorption of hydrogen;

removing hydrogen from the first reaction zone;

transporting at least partially dehydrided hydride-forming material from the first reaction zone to the second reaction zone;

supplying hydrogen to the second reaction zone;

removing heat at the second temperature from hydride-forming material in the second reaction zone to promote absorption of hydrogen; and

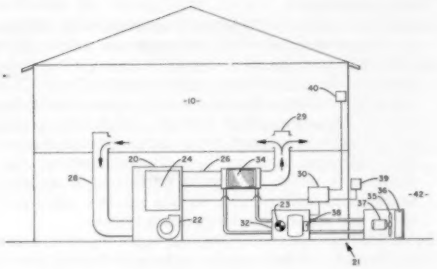
transporting at least partially hydrided hydride-forming material from the second reaction zone to at least one other reaction zone such that hydride-forming material is cyclically transported between the first and second reaction zones.

4,178,988

CONTROL FOR A COMBINATION FURNACE AND HEAT PUMP SYSTEM

Peter L. Cann, Canastota, N.Y.; Phil J. Karns, Sanibel, Fla., and Fred V. Honnold, Fayetteville, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,180
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **10 Claims**



1. A control circuit for a combination heating means and heat pump for conditioning an enclosure wherein the heating means has an actuating device to commence the generation of heat and blower actuated by a blower relay which circulates air through the area to be conditioned and wherein the heat pump has a compressor motor for operating the compressor, an outdoor fan motor for circulating fluid in a heat exchange relationship with an outdoor heat exchanger means including a defrost relay for defrosting the outdoor coil, an indoor coil mounted in communication with the air circulated by the blower and a reversing valve actuated by a reversing valve relay which comprises:

a temperature sensing means for making an electrical connection when heating is required in the enclosure;

means for supplying an electric current to the temperature sensing means;

switching means electrically connected to the temperature sensing means for selectively energizing either the compressor motor of the heat pump or the actuating device of the heating means depending on the temperature of the ambient fluid in communication with the outdoor heat exchanger, including no delay other than that which naturally occurs between switching from heating means heating to heat pump heating and the means for actuating the heating means for defrost includes no delay other than that which naturally occurs through switching; and

means for actuating the heating means to provide heat to the indoor coil when the means for defrosting the outdoor coil is energized including termination means for discontinuing defrost before heat pump refrigerant temperature or pressure reached excessive levels.

4,178,989
SOLAR HEATING AND COOLING SYSTEM

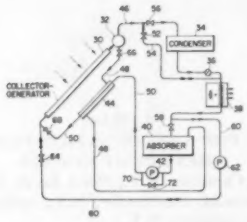
Isao Takeshita; Nobuhiko Wakamatsu; Eiji Ando; Hiroyoshi Tanaka, and Shiro Hozumi, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 14, 1978, Ser. No. 896,492

Claims priority, application Japan, Apr. 15, 1977, 52-53925; Jan. 27, 1978, 53-8755

Int. Cl.[2] F25B *13/00*

U.S. Cl. 165—62 **5 Claims**



1. A solar heating and cooling system comprising:

a solar collector to heat a liquid passing therethrough by solar radiation;

means for circulating a solution of an evaporable refrigerant in a less evaporable solvent through said solar collector;

an absorption refrigeration system including a vapor-liquid separator connected to an outlet of said collector, a condenser for condensation of a heated vapor of said refrigerant, an expansion valve through which the condensed refrigerant is introduced into an indoor heat exchanger for heat exchange between the refrigerant and air and an absorber in which the cooled refrigerant is absorbed in said solvent, said collector serving also as a vapor generator of said absorption refrigeration system;

a first fluid passage connecting said vapor-liquid separator to an inlet of said indoor heat exchanger through said condenser and said expansion valve;

a second fluid passage connecting an outlet of said indoor heat exchanger to an inlet of said collector through said absorber;

a third fluid passage to return unvaporized portion of said solution from said vapor-liquid separator to said absorber;

a fourth fluid passage which connects said vapor-liquid separator to said inlet of said indoor heat exchanger and bypasses said condenser and said expansion valve;

a fifth fluid passage which connects said outlet of said indoor heat exchanger to said inlet of said collector and bypasses said absorber;

first valve means for selectively blocking one of said first passage and said fourth passage;

second valve means for selectively blocking one of said second passage and said fifth passage such that said second passage is blocked when said first passage is blocked; and

third valve means for blocking said third passage when said second passage is blocked.

4,178,990
SOLAR ENERGY COLLECTOR SYSTEM

James M. Popplewell, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

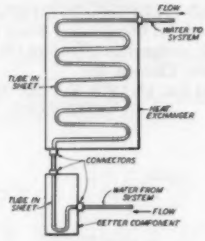
Filed Nov. 15, 1977, Ser. No. 851,699

Int. Cl.[2] F28F *19/00*; F24J *3/02*

U.S. Cl. 165—134 R **17 Claims**

1. In a solar energy collector system including at least one heavy metal element, at least one heat exchange panel having passage surfaces of aluminum or aluminum alloy, and a heat exchange medium, the improvement which comprises:

getter panel means having at least one passageway for providing turbulent passage of said heat exchange medium, said getter panel being located upstream and in close proximity with said heat exchange panel, and said passageway having a surface layer of material having a high affinity for heavy ions,



whereby heavy metal ions are removed from said heat exchange medium prior to contact of said ions with said heat exchange panel.

4,178,991
HEAT EXCHANGER AND A HEAT EXCHANGER ELEMENT THEREFOR

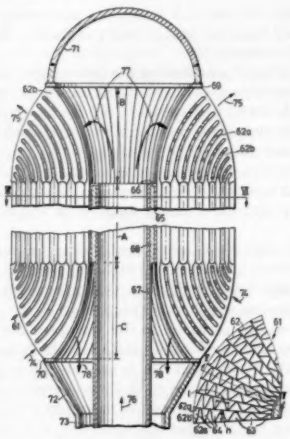
Hans Bieri, Dietikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Oct. 6, 1976, Ser. No. 729,978

Claims priority, application Switzerland, Jul. 30, 1976, 9754/76

Int. Cl.[2] F28F *3/02*

U.S. Cl. 165—166 **11 Claims**



1. In a heat exchanger having a longitudinally disposed tube for guiding one heat transfer medium therethrough,

a heat exchanger element disposed coaxially of the tube, said element having a plurality of walls extending outwardly from a longitudinally disposed central area, each of said walls being connected at an inner radial end to an adjacent wall and at an outer radial end to another adjacent wall to define flow zones on opposite sides of each wall, at least every second one of said walls following each other in the circumferential direction of said heat exchanger element being corrugated and having crests running in the direction of the longitudinal axis of said heat exchanger element;

a flat wall disposed between two corrugated walls, said corrugated walls having respective crests and troughs braced against said flat walls; and

means closing alternating flow zones to the remaining flow

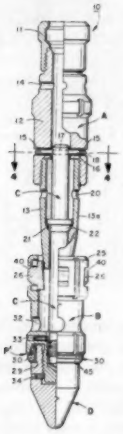
zones to form separate flow paths for two heat exchange media on opposite sides of each wall, said means defining an inlet for one heat exchange medium from the tube and an outlet for the other heat exchange medium to and from alternating flow zones at one longitudinal end of said element, and an outlet for the one heat exchange medium and an inlet for the other heat exchange medium from and to the alternating flow zones at the opposite longitudinal end of said element whereby the two heat exchange media flow in countercurrent through said element.

4,178,992

METAL SEAL TUBING PLUG

Louis M. Regan, Beaumont, Calif.; Thomas W. Childers, Mandeville, La.; Roy E. Anderson, and Joseph A. Burkhardt, both of New Orleans, La., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 30, 1978, Ser. No. 873,304
Int. Cl.[2] E21B *7/06*
U.S. Cl. 166—117.6 **10 Claims**



1. A plug for use in sealing a tubing, said tubing having a locking recess and a tapered sealing surface formed on the inner wall thereof, said recess having a tapered surface, comprising:

first and second housings;

an inner mandrel connecting said first and second housings together for limited movement therebetween;

locking means on said first and second housings cooperating to lock said plug in said tubing recess when said first housing is moved relative to said second housing,

said locking means on said first housing comprising a cone-shaped section and said locking means on said second housing comprising expansible-retractable lugs capable of being expanded by said cone-shaped section, said lugs having tapered surfaces for wedging against said tapered surface of said recess;

said second housing containing a tapered sealing surface and an annular metal seal means, said metal seal means having a first tapered sealing surface for sealing against said sealing surface on said tubing and a second tapered sealing surface for sealing against said sealing surface on said second housing to seal off the space between said tubing and said second housing, the distance between said tapered surfaces on said lugs and said first sealing surface on said metal seal means being precisely selected to ensure that said metal seal means is properly loaded for sealing when said plug is locked in said tubing recess.

4,178,993

METHOD OF STARTING GAS PRODUCTION BY INJECTING NITROGEN-GENERATING LIQUID

Edwin A. Richardson, and Ronald F. Scheuerman, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 807,946, Jun. 20, 1977, abandoned. This application May 4, 1978, Ser. No. 902,636
Int. Cl.[2] E21B *43/25*
U.S. Cl. 166—300 **12 Claims**

1. A process for treating a gas well from which production is prevented by the hydrostatic pressure of liquid contained within the well, comprising:

injecting into the well at least one aqueous liquid solution which forms or contains a nitrogen gas-forming mixture of (a) at least one water-soluble compound which contains at least one nitrogen atom to which at least one hydrogen atom is attached and is capable of reacting within an aqueous medium to yield nitrogen gas and byproducts which are substantially inert to the components of the well and reservoir formation, (b) at least one oxidizing agent which is capable of reacting with said nitrogen-containing compound to form said gas and byproducts, and (c) an aqueous liquid which is capable of dissolving or homogeneously dispersing said nitrogen-containing compound, the oxidizing agent and the byproducts of the nitrogen-gas-producing reaction;

correlating the composition of the nitrogen-gas-forming mixture with the pressure, temperature and volume properties of the reservoir and well components so that pressure and volume of the gas which is generated displaces sufficient liquid from the well to reduce the hydrostatic pressure to less than the reservoir fluid pressure; and,

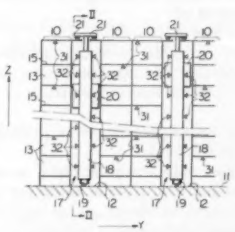
initiating gas production from the well by displacing liquid from the well in response to a flow of the pressurized gas formed by the generation of nitrogen gas and allowing gas to flow from the reservoir to the well.

4,178,994

FIRE EXTINGUISHING SYSTEM FOR WAREHOUSES

Akira Ito, Yokohama, and Masao Matsui, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Feb. 16, 1978, Ser. No. 878,466
Claims priority, application Japan, Feb. 16, 1977, 52-15690
Int. Cl.[2] A62C *3/00*
U.S. Cl. 169—52 **9 Claims**



1. A system for extinguishing a fire in a warehouse having a plurality of framed storage rack structures arranged parallel in a first coordinate axis to define parallel lanes between adjacent rack structures, each of said structures having a plurality of columns horizontally spaced along a second coordinate axis and a plurality of racks vertically spaced along a third coordinate axis so that a plurality of storage locations are defined and addressable in terms of the positions on said first, second and third coordinate axes and a vehicle-mounted, remote-controlled structure provided for each of said lanes and movable in response to a command signal along the lane including means

for carrying an article to a selected storage location for storage and delivery purposes, comprising:

a first plurality of fire detecting means located at various points of said storage rack structures for generating a first signal indicating the position of the fire in terms of said first and second coordinate axes;

a second plurality of fire detecting means mounted on opposite sides of said movable structures and vertically spaced to correspond to said storage locations to generate a second signal indicating the position of said fire in terms of said third coordinate axis;

control means responsive to said first signal to cause said movable structure to move to the indicated position on said first and second coordinate axes and responsive to said second signal to cause said article carrying means to move to the indicated position on said third coordinate axis; and

a fire extinguisher mounted on the article carrying means of each of said movable structures for directing a flow of fire extinguishing material toward the storage rack structure in response to said article carrying means reaching said position on said third coordinate axis, said fire extinguisher being provided with a pair of oppositely pointing nozzles to direct a flow of fire extinguishing material in opposite directions, and means for activating one of said nozzles depending on which side the fire is detected by said second fire detecting means.

4,178,995

SELF-PROPELLED BALLAST CLEANING MACHINE FOR ON- AND OFF-TRACK WORK

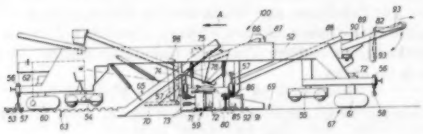
Josef Theurer, Vienna, and Karl Fölser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 13, 1977, Ser. No. 796,841

Claims priority, application Austria, May 31, 1976, 3987/76; Sep. 13, 1976, 6782/76

Int. Cl.[2] E01B *27/06*

U.S. Cl. 171—16 **19 Claims**



1. A self-propelled ballast cleaning machine useful for work in track switch and other widening track sections and comprising the combination of

(a) a machine frame,

(b) selectively operable on-track and off-track undercarriages supporting the machine frame at respective end regions thereof for selected on-track or off-track operation,

(c) a drive for the undercarriages for propelling the machine frame on- or off-track,

(d) a ballast material excavation chain mounted on the machine frame and adjustable in width for operation in widening track sections, the chain having a portion for excavating engagement with the ballast,

(e) a screen arrangement mounted on the machine frame and arranged to receive ballast material excavated by the chain from the chain for cleaning the excavated ballast material,

(f) a ballast storage means mounted on the frame immediately adjacent the ballast excavating chain portion, the ballast storage means having adjustable ballast discharge port means capable of discharging controlled amounts of ballast from the storage means,

(g) means for moving the excavated ballast material to the ballast storage means, and

(h) a ballast plow means vertically movably mounted on the machine frame and arranged to level the ballast discharged from the storage means, the plow means including

(1) plowshare means adjustable for leveling ballast in widening track sections.

4,178,996

SOIL CULTIVATING MACHINE

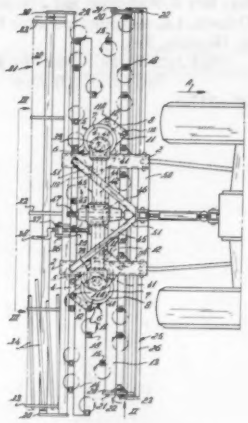
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 6, 1977, Ser. No. 840,045

Claims priority, application Netherlands, Oct. 12, 1976, 7611244

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **20 Claims**



1. A soil cultivating implement comprising a frame and at least two elongated carriers pivoted to said frame, said carriers extending transverse to the direction of travel, one behind the other and each carrier mounting downwardly extending tine means along the length thereof, driving means comprising common upwardly extending rotary shaft means and a corresponding eccentric mechanism that is pivoted to each carrier being journalled on said shaft means, each carrier being driven by spaced apart respective eccentric mechanisms with rotary shafts located at each side of the centerline of the machine, each rotary shaft having eccentric mechanisms mounted thereon, one above the other, a respective eccentric mechanism being pivoted to each carrier.

4,178,997

IMPLEMENTS WITH SIDE SCREENING PLATES

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Continuation of Ser. No. 393,026, Aug. 30, 1973, abandoned, which is a division of Ser. No. 172,511, Aug. 17, 1971, Pat. No. 3,774,689. This application Apr. 14, 1975, Ser. No. 567,695

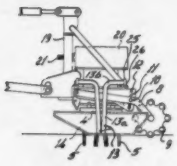
Claims priority, application Netherlands, Aug. 18, 1970, 7012157

Int. Cl.[2] A01B *33/12*

U.S. Cl. 172—112 **12 Claims**

1. A harrow comprising an elongated frame extending transverse to the normal direction of travel, a plurality of soil working members supported in a row on said frame, said soil-working members being rotatably mounted on upwardly extending shafts and each of said members comprising a support with at least one downwardly extending tine, a substantially vertical screening plate being normally positioned adjacent each opposite lateral side of said row and extending in the general direction of travel, said plate having an upper edge and a lower edge

that rides over the ground during travel, said plate being pivotably connected to said frame through arm means, said arm means extending from said plate and connected to said frame a



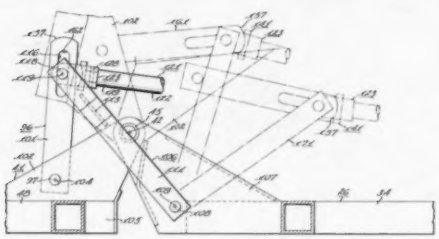
substantial distance from the lateral side of said frame, said plate being pivotably connected to said frame and freely turnable about an axis which extends generally parallel to the direction of travel of the harrow.

4,178,998

FOLDING MECHANISM FOR A MULTIPLE SECTION AGRICULTURAL IMPLEMENT

Randal L. Rockwell, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 17, 1978, Ser. No. 896,682
Int. Cl.[2] A01B *73/00*
U.S. Cl. 172—311 **12 Claims**



1. In a foldable, multiple section agricultural implement of the type having a pair of horizontally aligned sections and depending earthworking tools, said sections being pivotally interconnected on a longitudinal folding axis permitting one section to pivot relative to the other section between an extended working position in which said sections are horizontally aligned and a folded position in which said one section is in a reversed position above said other section with its tools projecting upwardly, a folding mechanism comprising:

a first link having one end pivotally connected to said one section on a first axis spaced from said folding axis,

a second link having one end pivotally connected to the other section on a second axis spaced from said folding and first axes,

lost motion connecting means pivotally connecting the other ends of said links to one another including,

a slot in the other end of said first link, said slot being elongated lengthwise of said first link, and

a pin part secured to the other end of said second link and operatively disposed in said slot, and

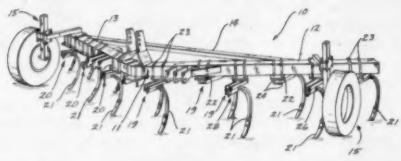
a linear actuating means mounted on said implement and connected to said second link operable to pivot said one section relative to said other section from said working position to a balanced overhead position and to said folded position, said actuating means including a (component) clevis having a base part from which a pair of legs extend, said legs being pivotally connected to said other end of said second link and said base part having an abutment shoulder in thrust transmitting engagement with said other end of said first link when said one section is in said overhead and folded positions, said abutment shoulder being out of engagement with said other end of said first link when said one section is in said working position.

4,178,999

REVERSIBLE TOOL MOUNTING BRACKET FOR AGRICULTURAL IMPLEMENTS

Elmer K. Hansen, 801 S. Martha, Sioux City, Iowa 51102

Filed Oct. 3, 1977, Ser. No. 838,744
Int. Cl.[2] A01B *23/02*
U.S. Cl. 172—702 **6 Claims**



1. A reversible mounting bracket for releasably securing a tool having a shank portion to the leg sections of a forwardly facing V-shaped tool bar of a farm implement for tilling soil, said mounting bracket comprising:

(a) a base plate with upper and lower surfaces,

(b) elongated tool mounting means fixed to and extended longitudinally of the lower surface of said base plate and having a tool supporting end portion projected outwardly therefrom,

(c) coupling means for attaching said base plate against the under surface of one of said tool bar leg sections such that in one position the projected end portion is located to the front of said tool bar leg section and in a reversed position is located to the rear of said tool bar leg section with the longitudinal axis of said tool mounting means directed parallel to the direction of travel of said farm implement,

(d) socket means fixed along the lower portion of the projected end portion of said tool mounting means and open at both ends to receive said shank portion through either end thereof, and

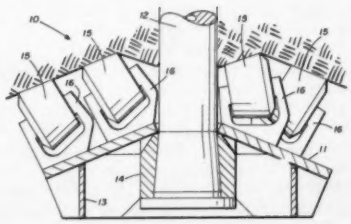
(e) retention means for releasably securing the shank portion of said tool in said socket means.

4,179,000

SELF-CLEANING RAISE BORING HEAD SYSTEM

Howard E. Mitchell, Duncanville, and William C. Saxman, Irving, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 5, 1978, Ser. No. 912,624
Int. Cl.[2] E21C *23/00*
U.S. Cl. 175—53 **2 Claims**



1. A raise head for enlarging a pilot hole into a large diameter hole by disintegrating the formations surrounding the pilot hole into debris and allowing the debris to fall down said large diameter hole, said raise head to be attached to a rotary drill string that extends through said pilot hole, comprising:

a conical main body, said conical main body comprising a truncated cone main plate having a smooth downward

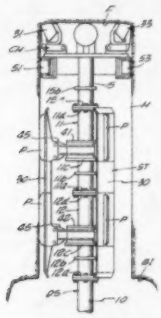
sloping outer surface, a central opening and a conical interior;
a drive stem projecting through said central opening and connected to said truncated cone main plate for attachment to said rotary drill string;
a cylindrical support frame positioned in said conical interior of said truncated cone main plate;
a series of inner struts positioned between said truncated cone main plate and said cylindrical support frame;
a multiplicity of outer struts extending radially outward from said cylindrical support frame supporting said truncated cone main plate;
a multiplicity of rolling cutter members for disintegrating the formations into debris and allowing the debris to fall onto said smooth downward sloping outer surface of said truncated cone main plate and continue down said large diameter hole, said rolling cutter members having a cutting profile that is substantially parallel to said downward sloping outer surface of said truncated cone main plate;
a multiplicity of cutter saddles mounted on said smooth downward sloping outer surface of said truncated cone main plate of said conical main body for rotatably supporting said rolling cutter members; and
a series of openings in said truncated cone main plate adjacent said cutter saddles.

4,179,001

UNDERGROUND DRILLING AND CASING METHOD AND APPARATUS

Norman H. Still, 617 Brookwood, and Robert W. Berry, Jr., 1566 N. Wardman, both of Brea, Calif. 92621

Filed Sep. 23, 1977, Ser. No. 836,219
Int. Cl.[2] E21D *3/00*; E21B *19/00*
U.S. Cl. 175—57 **19 Claims**



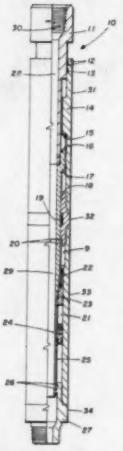
1. Underground drilling apparatus comprising:
a drill string;
a casing string disposed about said drill string;
a collapsible cutterhead attached to the forward end of said drill string, said cutterhead having a normal diameter which is significantly greater than the exterior diameter of said casing string, and having a collapsed diameter which is smaller than the interior diameter of said casing string;
the forward end of said casing string having a plurality of circumferentially spaced external ribs thereon, the effective diameter of said ribs being substantially equal to the normal diameter of said cutterhead; and
means for supporting and stabilizing said drill string within said casing string in concentric relation therewith, including skid means adapted to slide longitudinally within the interior surface of said casing string, and rotating bearing means secured to said drill string and to said skid means for supporting said skid means from said drill string in rotatable relationship to the longitudinal axis thereof;
whereby said drill string may be advanced relative to said casing string and concurrently drivingly rotated so as to cause said cutterhead to drill a hole, or alternatively, said cutterhead may be collapsed and said drill string may be retracted through said casing string so as to withdraw said cutterhead therethrough.

4,179,002

VARIABLE HYDRAULIC RESISTOR JARRING TOOL

James W. Young, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 25, 1978, Ser. No. 936,974
Int. Cl.[2] E21B *1/06, 1/10*
U.S. Cl. 175—297 **4 Claims**

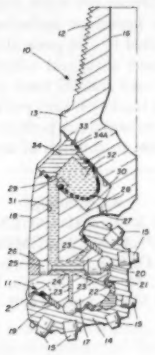


1. In a hydraulic jarring tool having an outer member and an inner member telescopically arranged with spline means between said outer member and said inner member for transmitting torque, an anvil and hammer means for providing a jarring effect, first seal means between said outer member and said inner member for providing a fluid seal, second seal means between said outer member and said inner member for providing a fluid seal, a working fluid chamber located between said inner member and said outer member and located between said first seal means and said second seal means, an operating fluid contained in said working fluid chamber, and sleeve valve means in said working fluid chamber for metering said operating fluid at a sleeve valve detent flow rate to allow said anvil and hammer means to provide said jarring effect, an improvement for externally adjusting the sleeve valve detent flow rate comprising:
said sleeve valve means including an adjustable orifice passage means having a moveable valve element that can be moved to provide different sleeve valve detent flow rates;
a hole in said outer member;
a removeable closure plug to be positioned in said hole and removed from said hole; and
an adjustment wrench for extending through said hole, contacting said moveable valve element and moving said moveable valve element to provide different sleeve valve detent flow rates.

4,179,003
SEAL FOR A ROLLING CONE CUTTER EARTH BORING BIT

Thomas W. Cooper, Mansfield, and Ernest E. Taylor, Irving, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 21, 1978, Ser. No. 971,776
Int. Cl.[2] E21B 9/08
U.S. Cl. 175—371 **1 Claim**



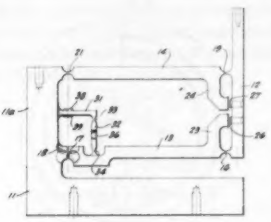
1. A rolling cone cutter earth boring bit for operation in a fluid-filled borehole, comprising:
- a bit body, said bit body having at least one downwardly extending arm;
- a cantilevered bearing pin extending from said arm;
- a rolling cone cutter rotatably mounted on said bearing pin, said rolling cone cutter having a cone mouth;
- bearing and cutter retaining means between said bearing pin and said rolling cone cutter;
- lubricant between said bearing pin and said rolling cone cutter;
- an outer rigid seal ring positioned around said bearing pin within said cone mouth, said outer rigid seal ring comprising an annular rigid ring that is split to allow radial expansion and contraction, said outer rigid seal ring positioned to be in contact with said rolling cone cutter in said cone mouth;
- an inner rigid seal ring positioned around said bearing pin within said cone mouth, said inner rigid seal ring comprising an annular rigid ring that is split to allow radial expansion and contraction, said inner rigid ring being smaller in diameter than said outer rigid ring and positioned to be in contact with said bearing pin in said cone mouth inside said outer rigid seal ring; and
- an elastomer ring located between said outer and inner rigid rings in said cone mouth, said elastomer ring being affixed to said outer and inner rigid rings, whereby fluid in said borehole can cause said elastomer ring to force said inner rigid ring to contract into tighter contact with said bearing pin and said lubricant between said bearing pin and said rolling cone cutter can cause said elastomer ring to force said outer rigid ring to expand into tighter contact with said rolling cone cutter.

4,179,004
FORCE MULTIPLYING LOAD CELL

Willem Ebbinge, Petaluma, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Filed Feb. 15, 1978, Ser. No. 878,063
Int. Cl.[2] G01G 3/14; G01L 5/12
U.S. Cl. 177—211 **22 Claims**

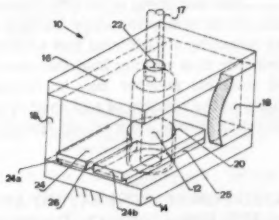
1. In a load cell: a base, a load arm spaced from the base for receiving a load applied in an axial direction, a lever arm with flexures toward the ends thereof interconnecting the load arm and base, a stabilizing arm with flexures interconnecting the load arm and base and cooperating with the lever arm to constrain the load arm for movement in the axial direction, a load beam affixed at one end to the base, a coupling link interconnecting the lever arm and the load beam, said link being connected to the lever arm at a point intermediate the ends thereof, and means responsive to stress in the load beam for providing an output signal corresponding to the load applied to the load arm.



4,179,005
WEIGHING APPARATUS CALIBRATION MEANS AND METHOD

Peter Kunz, Tann-Rüti, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Oct. 13, 1978, Ser. No. 951,087
Claims priority, application Switzerland, Apr. 19, 1978, 4184/78
Int. Cl.[2] G01G 7/00, 3/14
U.S. Cl. 177—212 **10 Claims**



1. In a weighing apparatus of the electromagnetic load compensation type including stationary permanent magnet means, a load compensation coil connected with the movable scale member for movement relative to said permanent magnet means, means for supplying compensating current to said coil for returning the scale member to an initial no-load position, and means for indicating the magnitude of the load as a function of the compensating current;

the improvement which comprises

(a) a generally U-shaped conductive metal plate (**24**); and

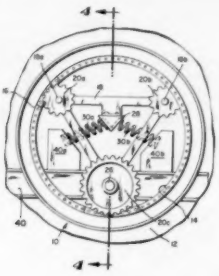
(b) means mounting said plate in spaced insulated relation adjacent a portion of said permanent magnet means, whereby when the leg portions of said plate are connected with an alternating current source, said plate functions as a single winding turn for varying the magnetization of said permanent magnet means.

4,179,006

TORSIONALLY RESILIENT COUPLING FOR TRANSMITTING ROTARY MOTION

Isidore J. Lenack, 6120 Jamieson Ave., Reseda, Calif. 91335, and Roger D. Lenack, 20357 Tuba St., Chatsworth, Calif. 91311

Filed Feb. 27, 1978, Ser. No. 881,777
Int. Cl.[2] B62D *55/00*
U.S. Cl. 180—10 **8 Claims**



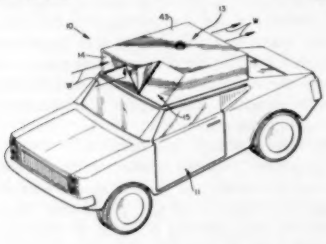
1. A torsionally resilient coupling for transmitting rotary motion, comprising, in combination:
- a cylindrical track;
- a rotatable member fixedly secured to said track to rotate therewith;
- a roller frame cooperatively associated with said track and having three separate roller means rotatably supported thereon, said three roller means rollingly engaging said track and being circumferentially spaced thereon so that said roller frame is rotatable relative to said track about the axis thereof;
- a shaft coaxially attached to one of said roller means to rotate therewith;
- housing means cooperatively associated with said shaft, said shaft being rotatable relative to said housing means in order to drivingly rotate said one roller means, said track, and said rotatable member; and
- bi-directional spring means coupled between said frame and said housing means and being resiliently deflectable so as to permit said frame to intermittently oscillate relative to said housing means by a significant part of a revolution;
- whereby in response to a varying load thereupon the rotation of said rotatable member may be retarded or advanced relative to the rotation of said shaft in accordance with the intermittent oscillation of said frame.

4,179,007

WIND OPERATED POWER GENERATING APPARATUS

Robert R. Howe, 4229 Timber Valley Ct., Decatur, Ga. 30032

Filed Jun. 1, 1978, Ser. No. 911,464
Int. Cl.[2] B60L *11/00*
U.S. Cl. 180—65 DD **15 Claims**



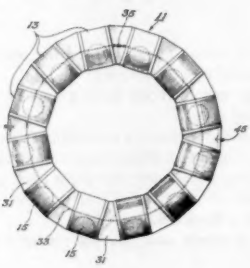
1. In combination, a self propelled vehicle and a wind operated electrical power system mounted on said self propelled vehicle, said power system comprising:
- a flywheel including an inner and an outer circumferential rim, said inner and outer rims being concentric and at least one of said circumferential rims comprising an annular track portion;
- a plurality of rotor vanes mounted on said flywheel, said vanes arranged such that wind striking said vanes urges rotation of said flywheel about an axis perpendicular to the direction of flow of the wind; and
- at least one electric generator including a generator shaft and a wheel mounted to said generator shaft, said generator being positioned with said wheel in direct rotating engagement with said annular track portion,
- whereby said wheel tracks on said track portion and tracking of said wheel on said track portion rotates said generator shaft in response to rotation of said flywheel.

4,179,008

STRUCTURE AND ARRANGEMENT FOR LOUDSPEAKER ASSEMBLAGE

Ted L. LeTourneau, P.O. Box 7655, Longview, Tex. 75602

Filed Apr. 24, 1978, Ser. No. 899,324
Int. Cl.[2] H05K *5/00;* **A47B** *81/06*
U.S. Cl. 181—147 **9 Claims**



1. A loudspeaker assemblage comprising:
- a. a group of speakers, with each speaker having a central axis;
- b. support means for each said speaker, with each said speaker being fixed to a respective said support means;
- c. means interconnecting all said support means to form an annular structure having a central axis and providing individual adjustment of said speakers to respective selected positions relative to a respective rotational axis which intersects and is normal to the respective said speaker central axis and also is normal to a radial plane of said annular structure that bisects said respective speaker and contains the speaker central axis, and with each said speaker facing away from a common side of the central plane of said annular structure.

4,179,009

MOUNTING ARRANGEMENT FOR A LOUDSPEAKER TO A RESONANCE PANEL PERMITTING FRONT INSERTION ASSEMBLY

Udo Birkner, Heinde, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

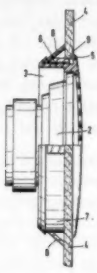
Filed Mar. 6, 1978, Ser. No. 883,813
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1977, 2711126
Int. Cl.[2] G10K *13/00;* **H04R** *7/00;* **H04M** *1/00*
U.S. Cl. 181—171 **6 Claims**

1. Mounting arrangement for a loudspeaker to a resonance panel (4) permitting assembly from the front side through an opening (9) in the panel having
- a holding ring (3) secured to the basket (2) of the loud-

speaker and formed with a radially extending flange (5) adapted to overlap the panel (4) at the front side thereof, and comprising, in accordance with the invention,

an outer thread (6) formed on the circumference of the holding ring (3);

and a mounting ring (7) having an inner thread matching the outer thread (6) of the holding ring, the mounting ring (7) having a plurality of resilient gripper fingers (8) extending from the circumference thereof which, in normal position, extend outwardly from the outline thereof and beyond the



back side of the panel (4) and being resiliently movable to within essentially the outline of the mounting ring (7) to permit snapping the assembly of the mounting ring and of the loudspeaker with the holding ring (3) thereon through the opening (9) and subsequent tightening of the loudspeaker flange (5) against the panel (4) by rotating the loudspeaker and the holding ring in the inner threads of the mounting ring, which is then held against rotation by frictional engagement of the gripper fingers (8) with the rear side of the panel (4).

4,179,010

ACCESS EQUIPMENT

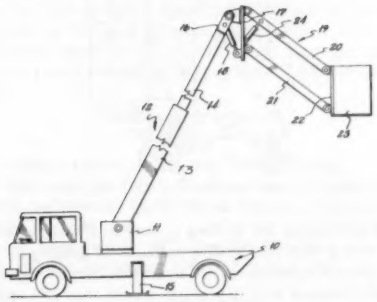
Denis H. Ashworth, Sedgley, England, assignor to Simon Engineering Dudley Limited, West Midlands, England

Filed Nov. 21, 1977, Ser. No. 853,414

Claims priority, application United Kingdom, Dec. 14, 1976, 52209/76

Int. Cl.[2] B66F *11/04*

U.S. Cl. 182—2 **2 Claims**



1. In a crane of the kind having a telescopically extendible jib pivotally connected at one end to a turntable, an accessory unit to be fitted to the free end of the jib of the crane, a bracket pivotally connected to said unit for rotation about a horizontal axis, first hydraulic cylinder means extending between said unit and the bracket and capable of being actuated to adjust the orientation of said bracket relative to the jib of the crane, said bracket comprising a bracket member having on one side means at its upper end for directly pivotally connecting it to said unit and lower vertically spaced means for directly pivotally connecting it to one end of said first hydraulic cylinder means which has its other end pivoted on said unit, said bracket being formed in two parts, one of which is said bracket member and the other of which is a spaced member to which the boom structure is pivotally connected, and there being means in said bracket for relatively pivoting said members about a vertical axis, a boom structure pivotally connected relative to said bracket for movement in a vertical plane about a horizontal axis, a working platform or cage pivotally connected to the end of said boom structure remote from said bracket, second hydraulic cylinder means for causing pivotal movement of said boom structure relative to said bracket and means for maintaining said working platform or cage level regardless of the angle of inclination of said boom structure.

4,179,011

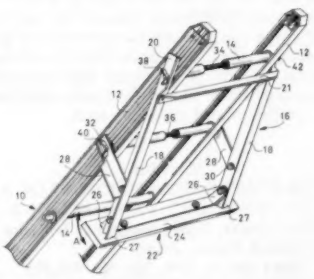
ROOFING LADDER AND BRACES THEREFOR

Janus Morawski, P.O. Box 562, Station P, Toronto, Ontario, Canada

Filed Oct. 21, 1977, Ser. No. 844,358

Int. Cl.[2] E06C *1/36, 7/48*

U.S. Cl. 182—45 **6 Claims**



1. Roofing ladder attachment means for a ladder of the type having hollow tubular rungs, said attachment means comprising;

an upper end brace for use on such a ladder and having leg means attachable to the upper end of the ladder, with its free end extending outwardly and downwardly, and strut means attachable to another point on the ladder, and connected with the leg means to secure the same in its angular relations to the ladder;

releaseable fastening means for securing the leg means, and the strut means to the ladder;

foot means on the leg means for lying on the roof and holding the ladder, and,

a ladder spacer attachable to said ladder spaced apart from said upper end brace, and having ladder connection means attachable in predetermined location on said ladder, and foot means on said connection means spaced downwardly from said ladder and adapted to lie on a said roof thereby raising said ladder off said roof, and wherein said ladder connection means comprises a pair of plate members spaced apart so as to register with two separate rungs of said ladder and further said fastening means extending through said holes and respective said rungs.

4,179,012

STAIRWAY-TYPE PASSENGER LIFT

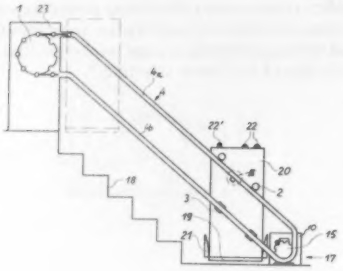
Heinz Heberle, Friedberg-West, Fed. Rep. of Germany, assignor to Rigert Maschinenbau AG, Immensee, Switzerland

Filed Apr. 28, 1978, Ser. No. 901,106

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719120

Int. Cl.[2] **B66B** *9/08*

U.S. Cl. 187—12 **10 Claims**



1. A lift comprising:

a wheel;

an endless flexible and generally inextensible conveyor element reeved over said wheel;

a pair of guides extending from said wheel and receiving said element to subdivide same into a respective pair of stretches, said guides and element being relatively dimensioned to prevent lateral bowing of said element;

a platform fixed on one stretch of said element;

drive means connected to said element for displacing same and conveying said platform along one of said guides; and

means including a speed-responsive brake in at least indirect continuous operative engagement with said element for arresting same when the displacement speed thereof exceeds a predetermined maximum level.

4,179,013

MEANS FOR ENSURING SECUREMENT OF A BRAKE ROTARY BODY TO A WHEEL HUB

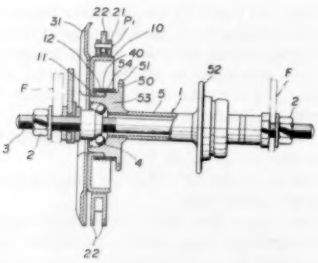
Masayoshi Kine, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 4, 1978, Ser. No. 931,003

Claims priority, application Japan, Aug. 9, 1977, 52/106846[U]

Int. Cl.[2] **B62L** *1/00*

U.S. Cl. 188—26 **11 Claims**



1. A brake mechanism for a bicycle which is screwed into engagement with a mounting tube forming a portion of a hub for a bicycle, the hub further comprising a hub shaft, a hub shell rotatably supported on said hub shaft, and a pair of hub flanges provided on said shell, comprising:

a rotary body screwed onto the mounting tube of a hub to rotate together with said hub, a cylindrical boss having a screw thread engaged with a screw thread on said mounting tube being provided on the center of said rotary body,

a braking member having a contact face which contacts said rotary body to stop the rotation of the rotary body, and

a coil spring wound on the outer periphery of the boss portion of said rotary body, the inner diameter of said coil spring being the equal to or smaller than the outer diameter of said boss portion in its unstressed condition, the inner face of said coil spring being in contact against the outer periphery of said boss portion, one end of said coil spring along the lengthwise direction extending onto said mounting tube when said rotary body is engaged with said mounting tube, the inner face of said extending portion being in contact against the outer peripheral face of said mounting tube, said coil spring having its diameter reduced through the rotation of said rotary body in a direction which would unscrew the rotary body from said mounting tube.

4,179,014

MECHANISM FOR LOCKING A PLATE WHICH IS MOVABLE ON A TABLE ALONG GUIDE MEANS

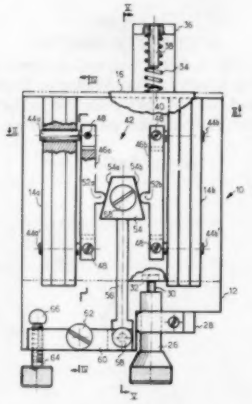
Emile Bailly, Les Lilas, France, assignor to Compagnie International pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Mar. 23, 1978, Ser. No. 889,516

Claims priority, application France, Apr. 19, 1977, 77 11743

Int. Cl.[2] **B61H** *13/00*

U.S. Cl. 188—43 **14 Claims**



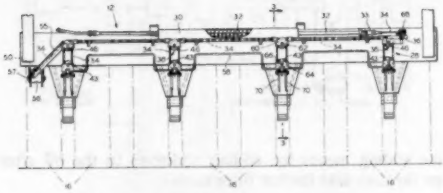
9. A mechanism for locking a plate in situ on a table provided with at least two guiding surfaces for guiding movement of the plate in a predetermined direction, comprising members movable between a first position where they are applied to fixedly connect the plate to said guiding surfaces at at least three contact areas and a rest position where the plate can be moved, at least one bar connecting one end of certain of said members together and having a projection, and ramp means inclined relative to said predetermined direction and freely movable substantially in the plane of said contact areas, said ramp means cooperating with said projection of said bar and with the remaining of said members for moving all of said members between said first and rest positions when said ramp means are displaced substantially in said predetermined direction.

4,179,015

MULTIPLE PARKING BRAKE

Robert L. Siewert, Benton Harbor, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Oct. 30, 1978, Ser. No. 956,462
Int. Cl.[2] F16D *65/30*
U.S. Cl. 188—106 P 5 Claims



1. In a vehicle having a plurality of spaced apart adjacent compacting wheels, wherein at least some of said wheels have operably associated braking mechanisms, a control system for actuating said braking mechanisms comprising:

a plurality of adjacent, spaced apart, pulley assemblies including a first and last pulley assembly, each of said assemblies including two side-by-side rotatably mounted fixed pulleys;

a corresponding plurality of adjacent, spaced apart, free pulleys, each of said pulleys associated with respective assemblies;

cable means linking each of said pulley assemblies to adjacent assemblies, and linking each of said assemblies to said corresponding free members by passing said cable means around one of said side-by-side pulleys to said free pulley and then back to said other side-by-side pulley, said cable means having two ends;

selectively operable means for shortening said cable between said first assembly and said last assembly, so that said respective free pulleys move substantially simultaneously toward associated respective assemblies when said shortening means is applied, said one end of said cable means connecting said first assembly to said shortening means;

an anchor point for the other end of said cable means;

said other end of said cable means linking said last assembly to said anchor point; and

a selectively operable actuator on each of said brake mechanisms for applying said brake mechanism to said wheels, each of said actuators connected with one of said free pulleys, so that said actuators are operated when said shortening means is operated, whereby the brake mechanisms of each wheel are substantially simultaneously applied.

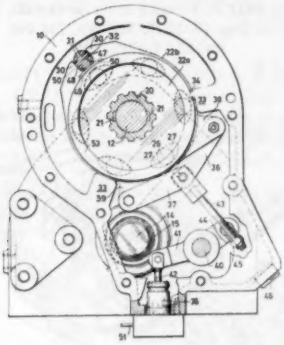
4,179,016

FINAL DRIVE GEARING WITH BRAKE

William Alderman, and Eric C. Hodgson, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Jan. 25, 1977, Ser. No. 762,300
Claims priority, application United Kingdom, Feb. 27, 1976, 7759/76
Int. Cl.[2] B60K *29/02*
U.S. Cl. 192—4 A 9 Claims

1. A final drive assembly, for an agricultural tractor or the like, comprising a casing in which there are journalled a final drive shaft and the outer end of a half-shaft, speed reduction gearing housed within the casing and driveably interconnecting the two shafts, a brake mounted on one of said shafts within the casing for establishing a frictional connection between said one shaft and the casing, and means for operating the brake comprising a hydraulic cylinder housed within the casing and having a piston rod extending within the casing, a bell crank lever fulcrumed within the casing and having one arm pivotally connected to said piston rod, and a rod within said casing



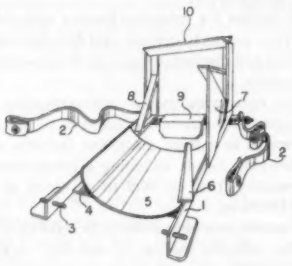
pivotally connected to the other arm of said bell crank lever and having an operative connection with said brake.

4,179,017

BALE TURNER

Martin C. Tilley, 683 Eastland Dr. S., Twin Falls, Id. 83301

Filed Apr. 3, 1978, Ser. No. 893,008
Int. Cl.[2] B65G *11/00*
U.S. Cl. 193—47 5 Claims



1. A bale turner for attachment to a bale making machine comprising:

(a) a first frame defining a rectangular space removably attached to a bale making machine and disposed in a downwardly sloping horizontal plane away from said bale making machine;

(b) a second frame disposed in a vertical plane attached to the first frame at its lower end, said second frame defining a space through which turned bales exit the bale turner;

(c) a concave platform attached to the first frame for receiving end first the bale to be turned;

(d) first guide means attached to said platform for rotating the turned bottom edge of the bale downwardly into said concave platform thereby partially rotating said bale around its longitudinal axis;

(e) second guide means disposed between and attached to the first and second frames for urging the new turned bottom edge of the bale in a downwardly direction;

(f) third guide means attached to the first and second frames and positioned on the first frame opposite the second guide means for urging the new turned top edge of the bale in an upward direction; and

(g) fourth guide means for urging the turned bale through the space defined by the second frame and off the bale turner without further rotation.

4,179,018

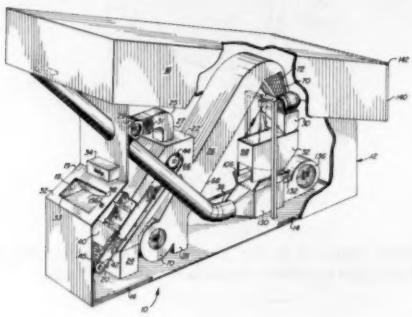
METHOD AND APPARATUS FOR SELECTIVE RECOVERY OF METAL CONTAINERS

John H. Miller, 6412 E. Voltaire Ave., Scottsdale, Ariz. 85254

Filed Dec. 27, 1976, Ser. No. 754,493

Int. Cl.[2] G07F *1/06*

U.S. Cl. 194—4 R **6 Claims**



1. An apparatus for receiving trash and recovering metallic containers of a preselected type from said trash, said apparatus comprising:

(a) a frame;

(b) an inlet hopper for receiving said trash;

(c) first conveyor means located to receive trash discharged from said inlet hopper;

(d) magnetic means for retaining ferrous materials on said first conveyor means to convey said ferrous materials to a first location and discharge said non-ferrous materials at a second location;

(e) pneumatic conveying means communicating with said second location for conveying materals of predetermined specific weight to a third discharge location, said pneumatic conveying means including a pressurized duct inclined upwardly from an inlet to an outlet at said third discharge location;

(f) crushing means receiving material fro said third discharge location for reducing the size of materials received;

(g) weighing means receiving the materials discharged from said crusher means;

(h) means responsive to said weighing means for issuing compensation related to the weight of material weighed;

(i) control means for regulating the flow of materials into said weighing means during a weighing cycle and for dumping said weighing means upon completion of a weighing cycle; and

(j) second conveying means for receiving the discharge from said weighing means and conveying same to a storage compartment.

4,179,019

APPARATUS FOR RECLAIMING USED LUBRICATING OILS

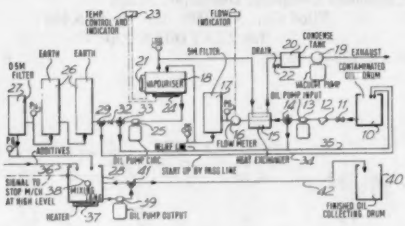
Harry L. Danziger, 21a Cork St., Old Bond St., London, England (W1X 1HB)

Filed Jan. 9, 1978, Ser. No. 868,262

Int. Cl.[2] C10G *33/00, 34/00, 41/00*

U.S. Cl. 196—46.1 **13 Claims**

1. Apparatus for reclaiming used lubricating oil on a continuous flow basis, comprising an inlet line for oil to be reclaimed, a first filter unit receiving oil from said inlet line, inlet pump means for pumping oil through said inlet line and said filter unit, a vaporizer unit receiving the oil after passage through said filter unit and wherein the oil is heated to drive off water and volatiles, further filter means including a plurality of earth filters, circulating pump means for pumping the oil from said vaporizer unit through said earth filters in succession, and



additive adding means for adding additives to the oil after passage through said further filter means.

4,179,020

TRANSPORTER FOR THE TRANSPORTATION OF PIECES OF BAGGAGE INTEGRATED WITH AN ESCALATOR

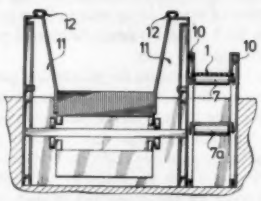
Helmut Heusler, Dortmund, and Fritz Behle, Hattingen, both of Fed. Rep. of Germany, assignors to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,368

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703436

Int. Cl.[2] B66B *9/12*

U.S. Cl. 198—326 **10 Claims**



1. A conveyor system for the transportation of pieces of baggage and the like from one conveying plane to another conveying plane integrated with an escalator for the transportation of people, comprising

an escalator,

at least one endless baggage conveyor belt arranged parallel to the escalator,

first balustrades cooperatively mounted at said baggage conveyor belt on both lateral sides thereof,

means for driving said conveyor belt synchronously with the escalator, said baggage conveyor belt is integrated with the escalator, said escalator has two second balustrades of a height substantially larger than that of said first balustrades,

one of the first balustrades is integrally mounted on one of said second balustrades.

4,179,021

LIFT DEVICE ARRANGEMENT

Charles H. Wallace, Carrollton, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 24, 1978, Ser. No. 889,713

Int. Cl.[2] B65G *42/00*

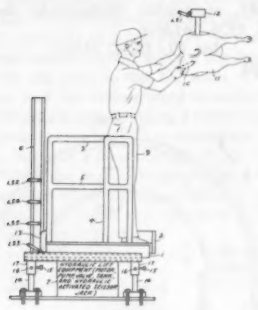
U.S. Cl. 198—341 **9 Claims**

1. An arrangement to measure the back fat thickness at three selected locations on animal carcasses conveyed on an overhead conveyor comprising:

a hydraulically operated lift means to raise and lower a single operator to enable said operator to make measure-

ments of said back fat thickness at said selected locations; and

circuit means coupled to said lift means and synchronized to



the movement of said conveyor to automatically control the movement of said lift means and to provide automatically an indication of the position of said lift means at which said operator is making each of said measurements.

4,179,022

INSTALLATION FOR THE PRODUCTION OF A MULTIPLE ROW CASK OF CONTAINERS

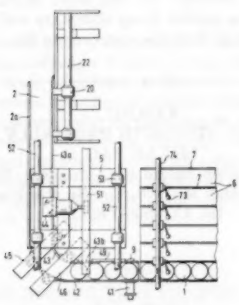
Diethelm W. K. Grocke, Nüremberg, and Klaus Wittmann, Lauf-Schönberg, both of Fed. Rep. of Germany, assignors to NUTRO Patentverwertungs- und Maschinenhandels-GmbH, Nuremberg, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,183

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638280

Int. Cl.[2] B65G *43/08, 47/68;* G06M *7/00*

U.S. Cl. 198—437 **7 Claims**



1. An installation for the production of a multirow cask of containers such as bottles, glasses, etc., including a conveyor belt, a feed track for the containers leading to said conveyor belt, and a guide channel for the introduction of the containers into several magazine tracks disposed in parallel side by side fashion, the improvement wherein the guide channel is of L-shape, formed of spaced lateral rails, said rails being continuous and including a first leg aligned in parallel to the direction of conveyance of the conveyor belt and a second leg integral with said first leg and extending coaxially to the feed track, means for stepwise shifting the L-shaped guide channel perpendicularly in relation to the direction of conveyance of the conveyor belt such that the end of the second channel leg is continuously connected with the feed track with its rails aligned therewith and the end of the first channel leg is stepwise connected to a given one of the parallel magazine tracks with its rails aligned therewith such that said bottles, glasses, etc., are fed sequentially to a given magazine track with the L-shaped guide channel stationary during feeding of multiple containers to said given magazine track.

4,179,023

APPARATUS FOR DISTRIBUTING SOLIDS IN GRANULAR OR LUMP FORM

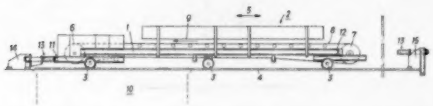
Hermann Hacker, and Waldemar Zehenthofer, both of Zeltweg, Austria, assignors to Vereinigte Oesterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Jul. 8, 1977, Ser. No. 814,126

Claims priority, application Austria, Jul. 6, 1976, 4932/76

Int. Cl.[2] B65G *41/02*

U.S. Cl. 198—631 **11 Claims**



9. In apparatus for distributing solids in granular or lump form over an area of defined width comprising a wheeled carriage which is reciprocal between two end positions along a path which corresponds to said width, said carriage carrying a longitudinally extending endless conveyor which is charged with the solids to be distributed and which has a discharge end that moves above said width during movement of said carriage, the improvement which comprises an elastically deformable energy storage and release device for limiting the movement of said carriage at each end of the path of movement of said carriage thereby absorbing energy from said carriage and for thereafter transferring energy back to said carriage to move the latter in an opposite direction, said device in its deformed position defining the respective end position of said carriage.

4,179,024

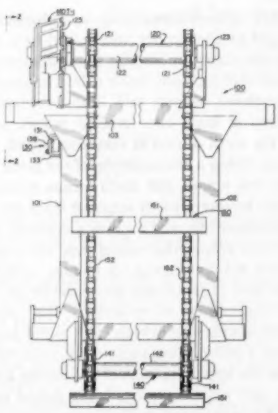
SCRAPER ELEVATOR DRIVE MOUNTING

Richard F. Boersma, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 13, 1976, Ser. No. 749,820

Int. Cl.[2] B65G *39/16*

U.S. Cl. 198—806 **5 Claims**



1. A mounting for a conveyor roller to establish tracking of a conveyor supported for movement in a predetermined endless path of movement upon drive and idler rollers comprising conveyor means supported for movement in a predeter-

mined endless path of movement upon a drive roller and a tail idler roller,

a support arm supporting one end of one of said rollers for pivotal movement relative to the endless path of movement of said conveyor means and cantilevered for movement in a plane transverse to the rotational axis of said roller,

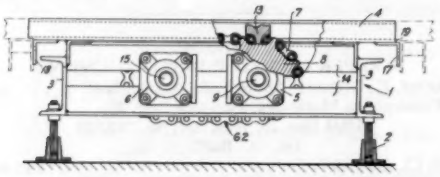
said support arm being a cantilever resiliently mounted to a frame within which said drive and tail idler rollers rotatably support said conveyor means, and an end of said support arm being fixedly secured to a bushing block supported about a resilient bushing secured to said frame to pivot said roller to a position in alignment with the endless path of movement of said conveyor means to track said conveyor means in said predetermined endless path of movement in response to movement of said conveyor means from said predetermined path of movement.

4,179,025

CONVEYOR SYSTEMS UTILIZING A CHAIN DRIVE MEANS

Remi R. Piette, Paris, and Francois M. A. Hubert, Vaucresson, both of France, assignors to Tissmetal Lionel-Dupont, Lyons, France

Filed May 12, 1977, Ser. No. 796,200
Claims priority, application France, May 18, 1976, 76 14938
Int. Cl.[2] B65G *23/16*
U.S. Cl. 198—833 **1 Claim**



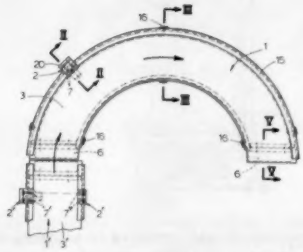
1. A conveyor system comprising a multiplicity of pallet assemblies linked to each other end-to-end in a closed loop, support and guide means mounting said pallet assemblies for movement about said loop and drive means connected to drive said pallet assemblies around said loop, wherein said drive means comprises at least one toothed wheel, chain means meshing with the teeth of said at least one wheel, the pitch of said chain means being a sub-multiple of the pitch of the teeth of said at least one wheel, and teeth means provided on said pallet assemblies having a pitch selected from the group consisting of a pitch equal to, and a pitch a multiple of, the pitch of the teeth of said at least one wheel, said teeth means of said pallet assemblies being adapted to engage selected ones of openings in the links of said chain means while the teeth of said at least one wheel engage other ones of the openings in the links of said chain means, in which each pallet assembly comprises a support, a pallet being removably mounted on a pallet support, so that the upper surfaces of the pallets form a continuous platform, said pallet supports being linked to each other end-to-end, and a vertical bearing axle providing a dismantable connection between successive pallet assemblies when the two adjacent pallets are removed, and wherein said vertical bearing axle has an end portion adapted to engage in a link of said chain means.

4,179,026

BELT CONVEYOR

Jacobus de Vries, Krommenie, Netherlands, assignor to Ammeral Nederland B.V., Wormerveer, Netherlands

Filed Sep. 14, 1977, Ser. No. 834,254
Claims priority, application Netherlands, Sep. 28, 1976, 7610713; Dec. 8, 1976, 7613616
Int. Cl.[2] B65G *23/06*
U.S. Cl. 198—834 **8 Claims**



1. A conveyor belt assembly comprising: an endless conveyor belt having an upper and a lower run, said conveyor belt being provided near at least one edge with an endless protrusion on the face of the conveyor belt opposite to the bearing surface thereof and following the conveyor belt in its longitudinal direction, said protrusion being in engagement with a plurality of guide discs which are rotatably supported adjacent the conveyor belt, at least one guide disc coupled with drive means through a drive shaft, said driven guide disc being displaceable in the transverse direction of the conveyor belt and pressing against the protrusion under the influence of a spring, counter-disc means being aligned with the driven guide disc and engaging the protrusion on a side remote from said guide disc, said counter-disc being mounted for free rotation on said drive shaft of the co-operating driven guide disc and bearing against a shoulder on said drive shaft, the endless conveyor belt being guided along stationary end guide members during its passage from the upper run to the lower run and vice versa.

4,179,027

HIGH IMPACT STRENGTH PARTIALLY LIQUID FILLED BAG

Warren Weisberg, 1048 Judson Ave., Evanston, Ill. 60202

Filed Aug. 24, 1978, Ser. No. 936,214
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—205 **3 Claims**

1. In combination: a completely sealed, rupture-proof, flat flexible bag comprising relatively closely spaced confronting walls of a flexible sheet material sealed together at contacting confronting peripheral surfaces thereof to form a sealed enclosed space which is opened only by severing a portion of the bag, said bag walls being so flexible as to collapse inwardly into

contiguous relation when otherwise unsupported and lying flat on a horizontal support surface; an open-cellular compressible body in said space and extending for most of the length of the bag, a liquid to be dispensed in said space and immersing said body so as to be pourable from the bag but which at all times only partially fills the unoccupied space in the bag whether the bag is oriented vertically or horizontally, so that when the bag is lying on a horizontal support surface the liquid therein still only initially fills the same so that the walls of the bag are not bulged thereby; and the cell-defining structure of said open-cellular compressible body providing a multitude of misaligned cell-defining structures which form numerous obstructions to the flow of the liquid in a direction parallel to the confronting walls thereof when the bag is supported on a horizontal support surface, so that when an impact force is than externally applied to the bag the liquid will not flow outwardly with a force which can rupture the bag.

4,179,028

CASING

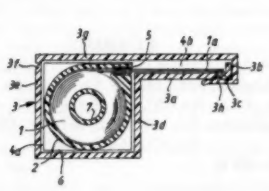
Otto Stemme, Münich; Peter Lermann, Narring; Dieter Engelsmann, Unterhaching, and Werner Went, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,414

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734322

Int. Cl.[2] B65D *85/67*

U.S. Cl. 206—316 **27 Claims**



1. A casing, particularly for roll film cartridges, comprising first wall means defining a hollow housing having a chamber adapted for closely receiving a film cartridge therein; and second wall means bounding a channel communicating with said chamber and operative for receiving an end portion of roll film which extends out of the cartridge when the latter is inserted into said chamber, said channel extending substantially tangentially to the outer surface of said cartridge and having at least one flat inner surface along which the end portion of roll film can extend.

4,179,029

FUNCTIONAL BLISTER PACKAGE FOR SNIPPER-TYPE SCISSORS

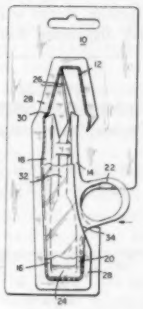
Wayne G. Fethke, Wausau, and Paul C. Mayer, Rothschild, both of Wis., assignors to Fiskars Manufacturing Corporation, Wausau, Wis.

Filed Jun. 1, 1978, Ser. No. 911,546

Int. Cl.[2] B65D *73/00, 85/00*

U.S. Cl. 206—349 **1 Claim**

1. A functional blister package for snipper-type scissors having a springy U-shaped end and free movable ends carrying pointed diamond-shaped blades and an integral thumb loop formed on one limb of the U-shaped end comprising a display card, a cut-out portion in the display card to allow free access to the thumb loop, a transparent, flexible, blistered elongated covering, an outwardly bent edge on the transparent covering facing the display card and made to adhere to said card, the transparent covering being generally shaped to conform to the shape of the snippers, one end of the generally elongated transparent covering being shaped to substantially enclose and lock in place the U-shaped end of the snipper, the other end of the transparent covering being trapezoidal in shape to permit restricted movement of the pointed blades which in their open position rest against the sides of the trapezoidal area of the said transparent covering and a cut-out portion in the transparent



blistered covering substantially midway between said free ends and said U-shaped end allowing the thumb loop of the snipper to project outside so as to permit the snippers to be grasped and moved back and forth by a prospective purchaser in the plane of the display card.

4,179,030

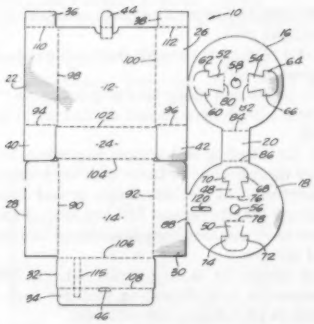
UNITARY FOLDABLE DISPENSER REEL AND CONTAINER WITH REMOVABLE DISPENSER PORTION

James L. Hayes, Garden Grove, and John T. Greenslade, El Toro, both of Calif., assignors to Eltra Corporation, Toledo, Ohio

Filed Nov. 24, 1978, Ser. No. 963,401

Int. Cl.[2] B65D *85/67*

U.S. Cl. 206—396 **15 Claims**



1. A foldable container for both containing and dispensing wire wound on a spool, the container being of unitary structure and comprising:

a. a first substantially rectangular portion having foldable margin portions along three sides thereof;

b. a second substantially rectangular portion connected to said first substantially rectangular portion at a margin thereof and having foldable margin portions along three sides thereof;

c. a first substantially circular portion tangentially connected to a margin portion of said second substantially rectangular portion;

d. a second substantially circular portion spaced from said first substantially circular portion;

e. a bridge tangentially connected to said first and second

substantially circular portions for supporting said circular portions substantially parallel to each other when folded; and

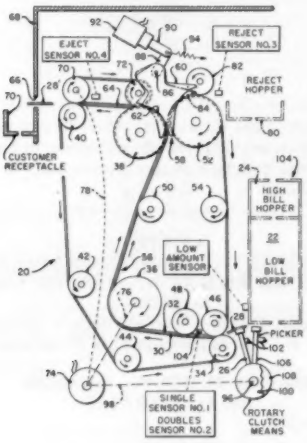
f. spindle means adapted for placement between said first and second substantially circular portions when said circular portions are folded into said parallel relation, whereby said spindle means may receive said spool of wire for selective dispensing thereof.

4,179,031

DOCUMENT DISPENSING SYSTEM

Stephen W. Ward, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 11, 1978, Ser. No. 904,957
Int. Cl.[2] B07C 5/00
U.S. Cl. 209—534 **17 Claims**



1. A document dispensing system comprising:

a dispensing path;

means for feeding documents from a source to and along said dispensing path;

sensors positioned along said dispensing path to detect the presence or absence of said documents in said dispensing path;

means for sampling said sensors to produce first and second states therein in accordance with the presence or absence, respectively, of said documents in said dispensing path;

first means for storing said first and second states to provide short-term and long-term histories of said states of each of said sensors;

second means for storing status data including a time in transport in said dispensing path for each of said documents in said dispensing path; and

means utilizing said short and long-term histories of said states and said times in transport for evaluating the status of each of said documents in said dispensing path with regard to predetermined criteria to control the disposition of each said document.

4,179,032

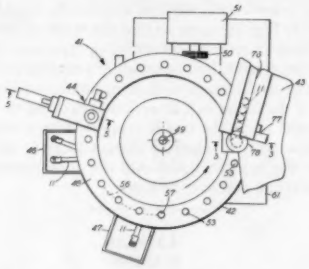
METHODS OF AND APPARATUS FOR CONVEYING, ORIENTING, TESTING AND SORTING ARTICLES

Walter M. Artz, Wyomissing Spring; Charles R. Bauer, West Lawn, and Paul W. Moyer, Wyomissing, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,899
Int. Cl.[2] B07C 5/02, 5/344
U.S. Cl. 209—538 **10 Claims**

1. A method of conveying and orienting an article having at least one end with at least a pair of intersecting planes terminating in a taper having an edge, which comprises the steps of:

positioning the article for rotatable movement into an opening in a first plate, the opening terminating with a contacting element of a second plate, said contacting element



being capable of frictionally engaging the outer portion of the edge of the taper; and

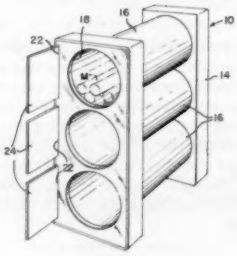
moving the first plate relative to the second plate to rotate the article in the opening to align one of the planes of the taper with the contacting element of the second plate.

4,179,033

MODULAR RACK FOR DISPLAYING MERCHANDISE

Patrick J. Mitchell, 836 Industry Dr., Tukwila, Wash. 98188

Continuation of Ser. No. 757,367, Jan. 6, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,419
Int. Cl.[2] A47F 7/17
U.S. Cl. 211—60 R **9 Claims**



1. A display rack for holding cylindrical objects such as rolls of wall coverings and displaying samples of the objects in a store showroom comprising:

multiple upright freestanding, lightweight, individual, freely movable tube support means, each having at least one circular opening whose axis is in a horizontal plane, and positioned adjacent one another to form a multiple, rack assembly,

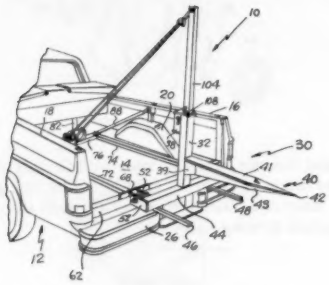
separate, independent horizontal circular tube means fitted in said tube support means so as to form a horizontal object supply storage compartment having a lower object supporting surface lying lengthwise of said tube means for receiving said cylindrical objects, and

display means external to and operatively associated with each storage compartment visible to the passing customer and adjacent an end of each storage compartment whereby samples of the objects being stored in each tube means can be conveniently displayed adjacent the end of the respective storage compartment.

4,179,034
BALE LOADER

Ferne Van Antwerp, Rte. #1, Unionville, Iowa 52594, and Raymond R. Murdy, Rte. #2, Moulton, Iowa 52572

Filed Nov. 24, 1976, Ser. No. 744,774
Int. Cl.[2] B66F 9/18
U.S. Cl. 414—551 21 Claims



1. A bale loader adapted to be mounted in the bed of a pickup truck, which comprises:

a frame assembly positionable in the bed of a pickup truck, said frame assembly including a rear transverse frame member positioned in use along the rear edge of said truck bed, a front transverse frame member positioned in use toward the front end of said truck bed, and rigid frame means connecting said front and rear frame members;

means for releasably securing said frame assembly to said truck comprising means for diagonally interconnecting said front transverse frame member to the respective sides of said pickup truck;

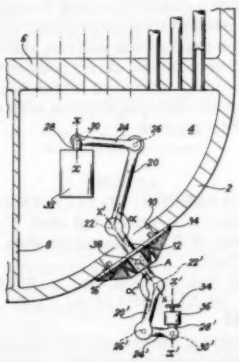
fork means mounted to said frame assembly for engaging a bale of hay; and

motor means mounted to said frame assembly for selectively operating said fork means.

4,179,035
BALANCED ARTICULATED MANIPULATOR

Daniel François, Vendome; Jean-Claude Germond, Paris; Paul Marchal, Gif-sur-Yvette, and Jean Vertut, Issy les Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 19, 1977, Ser. No. 862,152
Claims priority, application France, Dec. 22, 1976, 76 38698
Int. Cl.[2] B25J 1/02
U.S. Cl. 414—2 3 Claims

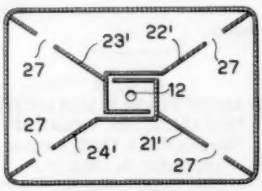


1. A manipulator of the type comprising a master arm and a slave arm and capable of operating within an enclosure limited by a wall provided with an opening for the introduction of said slave arm into said enclosure, wherein said manipulator comprises a central body of cylindrical shape having a longitudinal axis, a penetration plate designed to be fixed on said enclosure wall at the level of said opening, said cylindrical body being pivotally mounted in said plate around said longitudinal axis but not movable translationally along said longitudinal axis, said cylindrical body being provided with a handling trunnion externally of the enclosure, said central cylindrical body being provided with a first and a second extremity, a slave arm being pivoted to said first extremity and constituted by n (where n is strictly greater than 1) segments of generally cylindrical shape mounted in end-to-end relation and articulated with respect to each other, the last segment being fitted with a tool, a master arm pivoted to said second extremity and constituted by n segments of generally cylindrical shape mounted in end-to-end relation and articulated with respect to each other, the last segment being fitted with a control handle and with a balance weight, the segments of the master arm being in an inverted homothetic relationship with those of the slave arm with respect to the point of intersection of the axis of the central cylindrical body with the axis of said trunnion in a negative homothetic ratio equal to $-k$, the weights of the homothetic elements being substantially in a ratio equal to $1/k$, and transmission means constituted by chains, belts, cables or tapes and by pulleys for transmitting the movements of the master arm to the slave arm in such a manner as to ensure at each instant that the angle made by two segments of the master arm and the angle made by the two homothetic segments of the slave arm are equal and opposite, one segment of the master arm being such as to have dimensions equal to k times those of the corresponding segment of the slave arm.

4,179,036
MOTOR VEHICLE FUEL TANK

Luciano Pasini, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Jul. 10, 1978, Ser. No. 923,381
Claims priority, application Italy, Jul. 27, 1977, 26205 A/77
Int. Cl.[2] B65D 87/12, 87/46; F17D 1/00
U.S. Cl. 220—22 7 Claims



1. A motor vehicle fuel tank at the base of which there opens the mouth of a withdrawal conduit for the fuel fed to the vehicle engine, wherein said mouth is situated in a small chamber contained in the tank, bounded laterally by a baffle and communicating with the rest of the tank via at least one gap in the baffle, this gap extending in the form of a channel formed by parallel walls disposed side-by-side over a length substantially equal to the chamber dimension in the direction parallel to the side-by-side walls, wherein said baffle is of generally rectangular layout, and communicates with the rest of the tank via two gaps situated in proximity to the corners and extending in the form of channels in opposite directions along two opposing sides of the baffle.

4,179,037

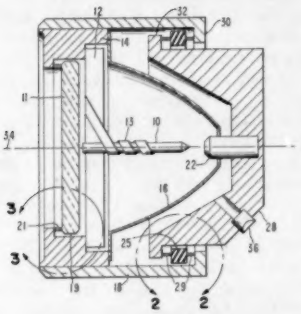
XENON ARC LAMP WITH COMPRESSIVE CERAMIC TO METAL SEALS

Edwin T. Chan, Sunnyvale, and Stanley R. Jepson, Campbell, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 767,854, Feb. 11, 1977, abandoned. This application May 15, 1978, Ser. No. 906,371

Int. Cl.[2] H01K *1/36*

U.S. Cl. 220—2.3 R **14 Claims**



1. An envelope for an arc lamp, said envelope being capable of containing a gas therewithin at a pressure higher than atmospheric pressure, said envelope comprising:

a first metallic member having an inwardly projecting flange portion,

a second metallic member having an outwardly projecting flange portion,

the outwardly projecting flange portion of said second metallic member being received within said first metallic member, the inwardly projecting flange portion of said first metallic member being disposed to overlap the outwardly projecting flange portion of said second metallic member, said overlapping flange portions of said first and second metallic members being radially spaced apart to define a generally annular region between said first and second metallic members,

a ceramic member disposed in said annular region, and

means for hermetically sealing said ceramic member to said inwardly and outwardly projecting flange portions so that said ceramic member is under compression when said envelope contains a gas at a pressure higher than atmospheric pressure.

4,179,038

SELF-SEALING FLANGE AND METHOD OF INSTALLATION THEREOF

José Rosán, Jr., Newport Beach, Calif., assignor to Rosan Engineering Corp., Newport Beach, Calif.

Filed Mar. 7, 1977, Ser. No. 774,880

Int. Cl.[2] F16L *3/12*

U.S. Cl. 220—243 **4 Claims**

1. A self-sealing flange assembly capable of being removably attached about a generally elliptical opening in a blind wall or similar structure; the self-sealing flange assembly comprising:

a generally elliptical opening in a workpiece;

an elliptical flange;

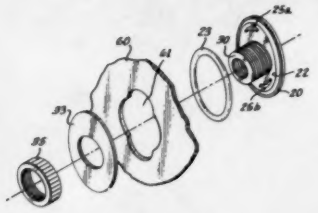
to which is fastened at a 90° angle thereto threaded attachment means;

the surface of the flange on which the threaded attachment means is located contains an elliptical groove around the outer periphery thereto;

at least one outwardly extending dimple means located at each end of the eliptical flange between the annular groove and the attachment means;

elliptical sealing means located in the elliptical groove;

elliptical washer means; and



threaded fastener means to coact with threads of the attachment means to draw the parts in sealing engagement with the inner and outer surfaces of the wall surrounding the elliptical opening.

4,179,039

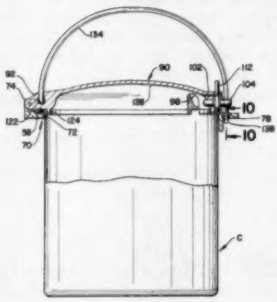
CLOSURE FASTENING MEANS

Raymond P. Kawolics, Solon, Ohio, assignor to The Meyer Dairy Products Company, Cleveland, Ohio

Filed May 19, 1977, Ser. No. 798,475

Int. Cl.[2] B65D *45/32*

U.S. Cl. 220—319 **10 Claims**



1. A lid and bail assembly for cooking pots or the like comprising: a generally flat transport ring member defining a circular opening; a lid member hinged to said ring member for movement between open and closed positions relative to said opening; a bail attached to at least one of said members for movement between a generally vertical transport position and a generally horizontal serving position; and, cooperating locking means between said bail and said ring and lid members for locking said lid member in said closed position with said bail in said generally vertical position and for releasing said lid member for movement to said open position with said bail in said generally horizontal position.

4,179,040

STORAGE AND SERVING CONTAINER OR THE LIKE

Robert F. Bateman, Greenville, and Jack V. Croyle, North Providence, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

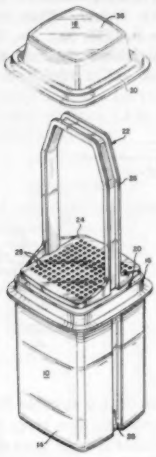
Filed Aug. 11, 1978, Ser. No. 933,003

Int. Cl.[2] B65D *25/10, 25/28*

U.S. Cl. 220—410 **11 Claims**

1. In combination a storage and serving container and including a receptacle having a plurality of generally vertically extending side wall members, an integral bottom wall portion, and a top end opening, at least one of said side wall members incorporating integral guide means, an insert positioned within

said receptacle and including a tray and rigid, unitary handle projecting therefrom and affixed thereto, said tray being of the approximate size and shape of said bottom wall, said handle being of such extent to protrude from said top end opening when said bottom wall and tray are in juxtaposition and being



shaped to cooperate with said guide means to enable the user to readily move the insert with respect to the receptacle while maintaining a relatively uniform parallel relationship between said tray and bottom wall, and a seal closuring said top end opening.

4,179,041

METHOD OF AN APPARATUS FOR EXTRACTING, MEASURING AND ADDING A PRODUCT

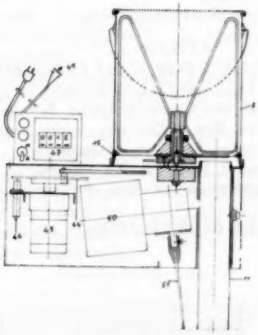
René Chambon, Chemin de la Pene, 65 310 Odos, France

Filed Jul. 18, 1977, Ser. No. 817,087

Claims priority, application France, Jul. 16, 1976, 76 22461; Nov. 10, 1976, 76 34543; May 13, 1977, 77 15469

Int. Cl.[2] B65B *1/04*

U.S. Cl. 222—1 **15 Claims**



1. A method of extracting and measuring out a first product and adding said product to a second product comprising:

(a) pressing a small quantity of the first product into a top opening in a measuring space, while a bottom opening in said space is closed,

(b) closing said top opening and opening said bottom opening whereby said small quantity of first product falls out of said space,

(c) making a cavity in said second product adjacent an exit position for said second product,

(d) feeding said quantity of said first product into said second product,

(e) mixing said quantity of said first product with said second product in the cavity, and

(f) feeding said mixed products out of said cavity.

4,179,042

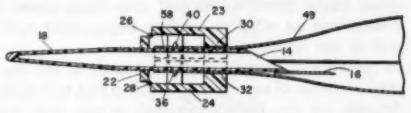
SEALED DISPENSER SPOUT ASSEMBLY

William H. Schuck, 9338 Perrin Beitel, Apt. #902, San Antonio, Tex. 78217

Filed Aug. 29, 1977, Ser. No. 828,305

Int. Cl.[2] B67B *7/26*

U.S. Cl. 222—89 **7 Claims**



1. A spout assembly for use in dispensing material from a flexible bag container, said assembly comprising a nozzle having an open inlet end, said inlet end being adapted to be disposed within said container and securing means carried by said nozzle for securing a portion of said container about said nozzle in sealing engagement therewith upon said inlet end of said nozzle being disposed within said container;

said securing means comprises at least one flexible arm member hingedly secured to said nozzle and means carried by said arm member for pressing a portion of said container against said nozzle in sealing engagement therewith.

4,179,043

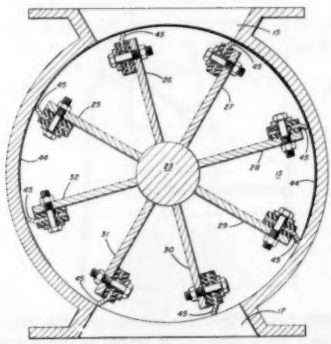
ROTARY VALVE APPARATUS

John Fischer, Montoursville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,644

Int. Cl.[2] G01F *11/24*

U.S. Cl. 222—368 **2 Claims**



1. A rotary valve apparatus comprising:

(a) a housing defining an open-ended generally cylindrical chamber;

(b) a plurality of end walls axially spaced along said housing, mounted to said housing enclosing said cylindrical chamber;

(c) inlet means for receiving material in said chamber;

(d) outlet means for depositing material from said chamber;

(e) a rotatable shaft extending axially throughout said cylindrical chamber and rotatably mounted in said end walls;

(f) a plurality of vanes fixably mounted to said shaft and extending radially from said shaft, said vanes having an axial extension throughout said chamber;

(g) vane blade means fixably mounted to said vanes, said vane blade means comprised of a plurality of elastomer strips and a metal strip partially sandwiched between said elastomer strips, and said metal strips fixably mounted to the radial extremes of each of said vanes and having an axial extension equal to that of said vane, said metal strip having an elbow extension not sandwiched by said elastomer strips and is in contact with said housing walls, said elbow extension being directed away from the direction of rotation of said shaft, said vane blade means in sealing engagement with the walls of said housing chamber such that thermal expansion of said vane creates a reactive compressive load from said housing wall on said metallic member which translates said compressive load to a rotational displacement within said vane blade means while maintaining an effective sealing engagement with said wall of said housing;

(h) a plurality of shrouds fixably mounted to the opposing axial extremes of said vanes parallel to said end walls, said shrouds are also fixably mounted to said shaft to form pockets with said vanes, said shrouds being of a circular construction with a radial extension within said cylindrical chamber providing for a minimum clearance sufficient to allow for thermal change without engaging said cylindrical chamber; and

(i) means for providing a seal between said end walls and said shrouds.

4,179,044

CLOSURE CAP FOR POURING OR DISPENSING TOPS OF BOTTLES OR SIMILAR RECEPTACLES

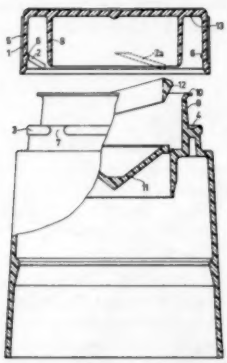
Daniel Fitte, Paris, France, assignor to Rical, S.A., Longvic, France

Filed Feb. 27, 1978, Ser. No. 881,673

Claims priority, application France, Feb. 28, 1977, 77 05794

Int. Cl.[2] B65D *41/06*

U.S. Cl. 222—551 **4 Claims**



1. Assembly consisting of a pouring top at the upper portion of a bottle neck and a closure cap having an outer skirt for said top, in which said cap is provided, on the inside, at the lower portion of its outer skirt with helicoidal ribs defined by disposed ribs of a small but constant width spaced apart and having a height component far greater than their width, said pouring top being provided with a peripheral rim having mutually spaced interruptions in number equal to the number of said helicoidal ribs, said ribs and said rim being of similar thickness in order that simple vertical pressure will cause, said ribs to pass in their entirety below said peripheral rim, the upper end of said helicoidal ribs being profiled in such a manner as to permit the lifting of said cap only after arcuate movement of said cap to register the upper end of said helicoidal ribs with said interruptions provided in said peripheral rim and so, by continuation of the arcuate movement to cause said ribs to pass through said interruptions to separate said cap from said top.

4,179,045

LIQUID TRANSFERRING DEVICE

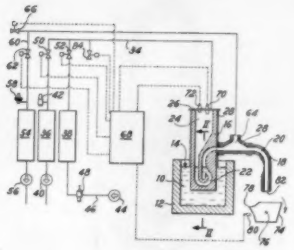
Piero Colombani, 11, Via Sigieri, Milan, Italy

Filed Feb. 8, 1978, Ser. No. 876,292

Claims priority, application Italy, Feb. 14, 1977, 20245 A/77

Int. Cl.[2] B22D *41/00, 45/00*

U.S. Cl. 222—590 **11 Claims**



1. In a liquid transfer device suitable for transferring high temperature liquids, contained at a given level in a first container, to a second container located at an elevation lower than said given level, said device comprising an inverted generally U-shaped siphon having a rising leg, a bight and a descending leg, and communicating with a gas-tightly sealable crucible filling chamber to form a hydraulic circuit having at least one liquid inlet port; wherein communication may be selectively effected between the crucible filling chamber and (1) a first vacuum means to withdraw liquid into the crucible filling chamber or (2) pressure means to push the liquid through the hydraulic circuit to prime the siphon, the improvement which comprises:

a prime-maintaining and degassing chamber formed in the bight of the inverted generally U-shaped siphon; and

second vacuum means communicating with the degassing chamber and selectively operable to apply a negative pressure to the degassing chamber throughout the transfer operation sufficient to maintain the prime and to degas the liquid in the siphon pipe.

4,179,046

REFRACTORY PLATE FOR SLIDE CLOSURES OF METALLURGICAL VESSELS

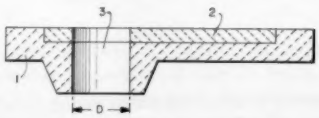
Peter Jeschke, Walluf, and Günter Gelsdorf, Wiesbaden-Nordenstadt, both of Fed. Rep. of Germany, assignors to Didier-Werke A.G., Wiesbaden, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,690

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719105

Int. Cl.[2] B22D *37/00*

U.S. Cl. 222—600 **15 Claims**



1. A refractory plate for use in slide closures for metallurgical vessels, said refractory plate comprising:

a basic plate element adapted to face a liquid metal melt, said basic plate element being formed of a moldable refractory concrete material;

said basic plate element having embedded therein and forming a melt contacting surface thereof a ceramic oxide

insert having a cold bending strength higher than 300 kp/cm^2, a hot bending strength at 1500° C. higher than 40 kp/cm^2, a cold compressive strength higher than 2000 kp/cm^2, and a permeability to gas lower than 1.0 nanoperm;

said insert being enbedded directly in said moldable refractory concrete material of said basic plate element before said moldable refractory concrete material has set;

said basic plate element and said insert having extending therethrough a throughflow opening; and

said insert having a width, taken in a direction transverse to the direction of movement of said refractory plate when used in a slide closure, of from 1.3 to 3.5 times the diameter of said throughflow opening.

4,179,047

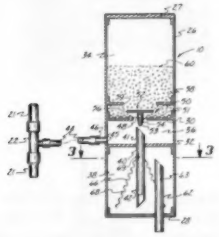
CHEMICAL METERING APPARATUS

Alfred H. Abdoo, 2116 W. Encanto Blvd., Phoenix, Ariz. 85009

Filed Mar. 27, 1978, Ser. No. 890,248

Int. Cl.^{2} B67D *5/60*

U.S. Cl. 222—133 **12 Claims**



1. An apparatus for controlled dissolution and metering of a dry water soluble water treatment chemical comprising:

(a) a housing having a closed top and bottom;

(b) a partition in said housing to provide a chemical compartment therein immediately above a humidity compartment;

(c) a dry water treatment chemical in said chemical compartment, said water treatment chemical in powdered or granulated form and having the characteristic of dissolving into a liquid upon being exposed to moisture in vaporous form;

(d) inlet means on said housing for supplying water to said humidity compartment for production of moisture in vaporous form;

(e) outlet means in said housing for allowing water to exit from said humidity compartment; and

(f) metering means on said partition and communicating between said chemical compartment and said humidity compartment, said metering means for controlling the migration of the moisture in vaporous form from said humidity compartment to said chemical compartment to control the dissolution of said chemical and for metering the liquified chemical into the water flowable through said humidity compartment.

4,179,048

SEED SPREADER

Carl M. Pickett, 12 Robin Rd., Farmington, Conn. 06032

Filed Mar. 1, 1978, Ser. No. 882,330

Int. Cl.^{2} A01C *7/02*

U.S. Cl. 222—44 **19 Claims**

1. A hand held dispenser for seeds or the like comprising:

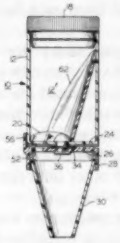
(a) a receptacle adapted to contain seeds or the like therein, and having a bottom wall;

(b) a selector plate disposed in close proximity to said bottom wall, one of said selector plate and receptacle bottom wall having an outlet opening and the other of said selector plate and receptacle bottom wall having a plurality of spaced apart, differently configured control openings formed therein;

(c) selector mounting means mounting said selector plate to extend along and be movable relative to said bottom wall to permit selective alignment of any one of said control openings with said outlet opening to provide a discharge opening extending from within said receptacle to exteriorly thereof;

(d) an agitator blade within said receptacle;

(e) blade mounting means mounting said agitator blade for periodic movement within said receptacle adjacent said bottom wall;



(f) a closure plate having a dispenser opening therein and extending exteriorly of said bottom wall to close said discharge opening; and

(g) closure mounting means mounting said closure plate to be movable relative to said discharge opening to permit selective movement of said closure plate dispenser opening into and out of register with said discharge opening for intermittent opening and closing thereof, whereby to cooperate with movement of said agitator blade for intermittent discharge of seeds or the like from said receptacle through said discharge opening.

4,179,049

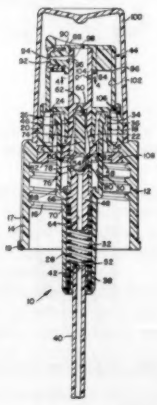
PUMP DISPENSER

Herbert R. Umstead, Warwick, N.Y., assignor to Avon Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 792,414, Apr. 29, 1977, abandoned. This application Jan. 26, 1978, Ser. No. 872,544

Int. Cl.^{2} B05B *7/32*

U.S. Cl. 222—631 **3 Claims**



1. A dispenser for communicating both a liquid from a reservoir of a receptacle and a pressurized fluid carrier from an air

pump chamber to a flow path and passing a liquid in an atomized state from an exit orifice comprising:

(a) a housing adapted for receipt on said receptacle;

(b) a liquid pumping mechanism, said liquid pumping mechanism carried by said housing and including

(1) a liquid pump chamber adapted for communication with said reservoir,

(2) a piston movable in said liquid pump chamber and including a hollow stem defining a portion of said flow path,

(3) a valve seat in said stem,

(4) a valve in said liquid pump chamber adapted for movement relative to said valve seat to control communication of liquid from said liquid pump chamber to said flow path,

(5) a spring urging said piston and valve in one direction whereby said valve moves into said valve seat, and

(6) an actuator mounted on said stem for moving said piston in the other direction to pressurize said liquid pump chamber, which pressure acts on said valve to overcome the force of said spring whereby said valve moves in said other direction relative to said piston and out of said valve seat;

(c) an air pumping mechanism including said air pump chamber, said air pump chamber defined by a wall of said housing continuous around said stem and a skirt of said actuator juxtaposed to said wall, one of said wall and skirt having sealing means cooperating therebetween so that said air pump chamber which normally is open to atmosphere is sealed when said actuator is moved relative to said wall in said other direction and the air therein is compressed; and,

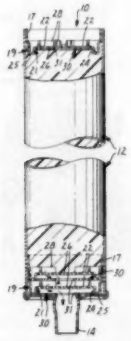
(d) a plurality of openings formed in said stem, said openings disposed equiangularly around said stem and arranged thereby to direct air under pressure and along multiple paths into said flow path to enhance mechanical break-up and atomization of liquid flowing therein.

4,179,050

FLUID DISPENSING PISTON

Francis M. Farrell, III, Grant Township, Washington County; Robert B. Otto, Champlin, and William J. Seim, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed May 10, 1978, Ser. No. 904,600
Int. Cl.[2] B67D *5/42*; G01F *11/04*
U.S. Cl. 222—386 **8 Claims**



1. A fluid dispensing piston for a cylindrical dispensing tube, comprising:

a plastic body having

a hollow cylindrical sealing portion with an outside diameter equal to the internal diameter of a said tube,

a cylindrical stacking portion extending coaxially from said sealing portion and having an outside diameter less than the internal diameter of said sealing portion, and

a transverse wall spanning said body, said transverse wall being recessed axially inward from the ends of said body and being formed with at least one aperture therethrough, and

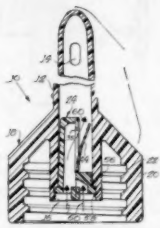
a fluid seal retained on one face of said transversewall over said aperture and movable away from said transverse wall in response to fluid pressure applied to the opposite face of said transverse wall to permit fluid to flow through said aperture only from said opposite face toward said one face.

4,179,051

ONE-PIECE CHECK VALVE FOR USE IN A FLUID DISPENSER

Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Barrington, Ill.

Filed Aug. 1, 1977, Ser. No. 820,638
Int. Cl.[2] B65D *39/00*; F16K *15/14*
U.S. Cl. 222—494 **7 Claims**



1. A one-piece molded check valve for use in a fluid applicator tip, or the like, comprising a first portion having an open chamber with a seat about the open end thereof, and a fluid inlet port opening to said chamber, a second portion including a flexible reed member, and an integral flexible hinge section joining said first and second portions, and enabling said portions to be folded over and engaged in superposed relation, with said second portion overlying said seat to close said chamber provided by said first portion, said second portion further including an enlarged section, adjacent said reed member, with port means formed in said enlarged section and leading into said chamber when said portions are engaged in superposed relation to provide an additional inlet port for said chamber with said flexible reed member being displaceable under fluid flow from said inlet ports through said chamber to permit fluid to pass out of said chamber, with fluid flow in the opposite direction forcing said reed member into engagement with said seat to prevent flow through said chamber in said opposite direction.

4,179,052

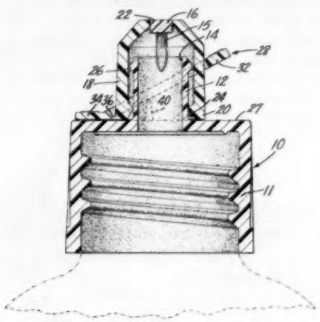
CONTAINER CAP

Horace P. Abbott, Lake Leelanau, Mich., assignor to Lever Brothers Company, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,854
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—509 **8 Claims**

1. In a container cap including base means for attachment to an open end portion of a container, said base means including

a tubular portion terminating in an open end, a plug member, support means for fixedly securing said plug member to and axially beyond said open end of said tubular portion, said support means extending over and leaving at least partially open said open end of said tubular portion, and a sleeve constrained in surrounding relation on said tubular portion, said sleeve being displaceable axially along said tubular portion between two extreme positions, said sleeve terminating in an open end corresponding cross-sectionally in size and configuration to said plug member, said sleeve having an axial extent such that when it is in one of said extreme positions said open end thereof surrounds said plug member substantially in fluid-sealing relation, an improvement comprising sleeve-displacement means for shifting said sleeve relative to said tubular member to the other of said extreme positions, said sleeve when in said other of said extreme positions having a disposition such that said open end thereof is remote from said plug member and entirely open, said sleeve-displacement means including a hand-operable first actuation element which is uni-directionally actuable in a direction opposite the direction said sleeve is displaced to said other of said extreme positions at which said open end of said sleeve is remote from said plug member, and a hand-operable second actuation element which is uni-directionally actuable in a direction which is the same as the direction said sleeve is displaced to said one of said extreme positions at which said open end of said sleeve surrounds said plug member in substantially fluid-sealing relation.

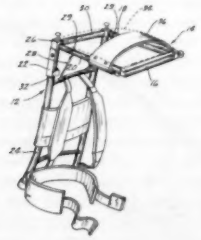


4,179,053

AWNING FOR BACK PACK

Gene B. Figura, 1502 Linden Dr., Ames, Iowa 50010

Filed Jan. 26, 1978, Ser. No. 872,507
Int. Cl.[2] A45B *11/02*
U.S. Cl. 224—190 **1 Claim**



1. In combination, a back pack having a first frame means, and an awning comprising,

a second support frame means including opposite, spaced apart side members, said side members being detachably secured at one end to said first frame means,

a canopy member attached to and extended between said side members, said canopy member comprising a pliable material capable of providing insulation from sunlight and rain,

said side members and canopy being capable of being rolled together into a compact shape upon detachment of said side members from said first frame means,

means for detachably securing said side members to said first frame means such that said canopy member resides above and extends over the head of the wearer of said back pack, and

a stiffener element connected to and extended between said side members, said stiffener element having a raised center portion to maintain said canopy member in a concave disposition relative to said wearer's head to facilitate rain water run off from said canopy member, and

an elastic shock absorbing member having first and second ends extending between said second frame means and said first frame means to provide support to said second frame means and to maintain said second frame means in a generally horizontal plane above said wearer's head, said first end being detachably secured to said second frame means and said second end being detachably secured to said first frame means,

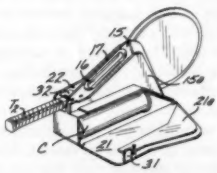
said means for detachably securing said second frame means to said first frame means comprising at least one clamp detachably receiving one of said side members, said clamp being pivotally attached to said first frame means for pivotal movement between a first position wherein said second frame means is supported forwardly of and in a relatively perpendicular disposition to said first frame means and a second position wherein said second frame means is supported rearwardly of said first frame means, said clamp including stop means for limiting pivotal movement of said clamp to said first and second positions.

4,179,054

RACQUET CARRIER

Edwin L. Bredehoeft, 16761 Green St., #A, Huntington Beach, Calif. 92649, and Robert E. Lee, 15 Ima Loa, Newport Beach, Calif. 92663

Filed Jun. 12, 1978, Ser. No. 914,793
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 L **5 Claims**



1. A carrying structure adapted to store a plurality of racquets or other athletic devices together with the balls useful therewith, comprising:

a hollow base structure conformed as a rectangular cavity including a dorsal peripheral segment and a ventral peripheral segment joined in common at the ends thereof and separated relative each other to receive a plurality of said balls therebetween;

a planar handle assembly attached to the exterior surface of said dorsal segment to project orthogonally therefrom;

a first and second side plate hinged from the respective lateral edges of said ventral segment and disposed for pivotal motion to abut the lateral edges of said dorsal segment for alignment adjacent said planar handle assembly, said side plates and said handle assembly projecting beyond said dorsal segment to form opposing surfaces of a planform substantially smaller than said racquets;

a deformeable liner attached to the lateral surfaces of said

handle assembly and to the opposing surfaces of said first and second side plate; and

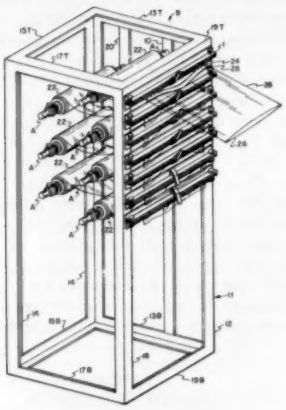
engaging means extending proximate the free edges of said side plates and deployed to engage said handle assembly said engaging means releasably securing said side plates to said handle assembly at a separation whereby said liner is deformably engaged against said racquets inserted therebetween.

4,179,055

DEVICE FOR SEPARATING SHEET BAGS

Burl D. Milner, Grand Prairie, Tex., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Jun. 3, 1977, Ser. No. 803,184
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—80 **5 Claims**



1. A device for separating sheets from a continuous strip of material comprising:

a horizontal plate for supporting said material to be separated;

a horizontal pressure bar juxtapositioned to said plate and spaced apart to define a horizontal slot therebetween to permit passage of said material therebetween;

means for urging said pressure bar into contact with said material to restrain the passage of material; and

a bearing having a cutting edge projecting outwardly from the central portion only of said plate toward said pressure bar, said bearing vertically traversing the full height of said slot and terminating at a point offset from said pressure bar whereby said material must contact said pressure bar during passage through said slot and across said bearing and whereby said bearing facilitates separation of sheet sections along scores therebetween and display of the next succeeding sheet for easy grasp by an operator.

4,179,056

WIRE-FEEDING MECHANISM

Donald W. Schmerling, York, Pa., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 714,519, Aug. 16, 1976. This application Apr. 5, 1978, Ser. No. 893,654
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—171 **5 Claims**

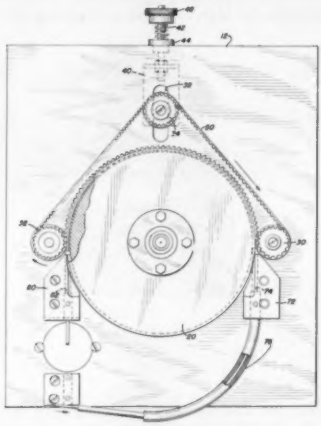
1. A wire feeding mechanism for feeding malleable wire comprising:

a housing;

a pulley formed on its edge with a continuous circumferential grove and rotably mounted on said housing;

a plurality of toothed rollers rotatably mounted on said housing;

an endless flexible belt disposed around said rollers and in the same general plane as that defined by the circumferential groove of the pulley, said belt lugged on one face so as to interengage with said rollers, said belt engaged between a first of said rollers and said pulley and between a second of said rollers and said pulley, and engaged against at least a portion of said edge of said pulley and completely overlying the groove over a substantial arcuate segment of the pulley, said belt presenting a continuous smooth face to said edge of said pulley, a third roller mounted within the endless belt to maintain the lugs on the inner face of the



belt in spaced relation and to maintain the belt in continuous tension; and

means for driving said second of said rollers,

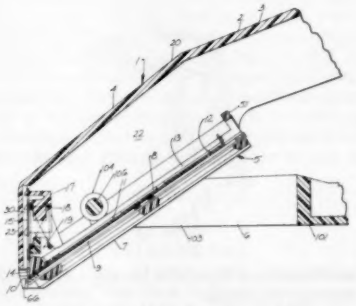
whereby said pulley and said belt are driven, and whereby malleable wire inserted into said groove between said belt and said edge of said pulley at said first of said rollers is held in and fed through said groove over said substantial arcuate segment where said belt engages said edge of said pulley and emerges from said groove at said second of said rollers.

4,179,057

DISPOSABLE SURGICAL STAPLING INSTRUMENT

Carl T. Becht, Cincinnati, and J. Charles Hueil, Loveland, both of Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Nov. 17, 1978, Ser. No. 961,740
Int. Cl.[2] A61B *17/04;* B25C *5/02*
U.S. Cl. 227—19 **16 Claims**



1. A surgical stapling instrument for implanting and forming surgical staples in the skin or fascia of a patient, said instrument comprising an elongated body having a rearward portion

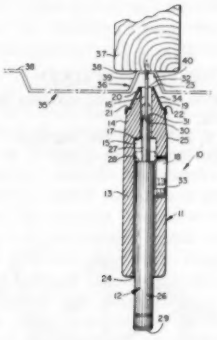
constituting a handle portion and a forward portion, a staple driver and a staple driver actuator attached to said staple driver being housed within said body forward portion, a surgical staple magazine affixed to said body forward portion, an anvil plate mounted within said magazine, said anvil plate terminating at its forward end in a coextensive anvil surface, a row of staples slidably mounted on said anvil plate, a feeder assembly mounted in said magazine to constantly urge and advance said row of staples along said anvil plate toward said anvil surface to locate the forwardmost staple of said row thereon to be implanted and formed thereabout by said driver and to disengage said forwardmost staple therefrom when formed, said staple driver being shiftable between a retracted position above said anvil surface and a staple forming position wherein it forms said forwardmost staple about said anvil surface, trigger means to shift said staple driver between said retracted and said staple forming positions, said trigger means being pivotally affixed to said body and operatively connected to said staple driver by way of said staple driver actuator, and means to bias said staple driver to said retracted position.

4,179,058

SOFFIT NAIL SET

Neal E. Yost, 415 Nescopec St., Tamaqua, Pa. 18252

Filed Jun. 15, 1978, Ser. No. 915,785
Int. Cl.[2] B25C *9/00*
U.S. Cl. 227—147 **7 Claims**



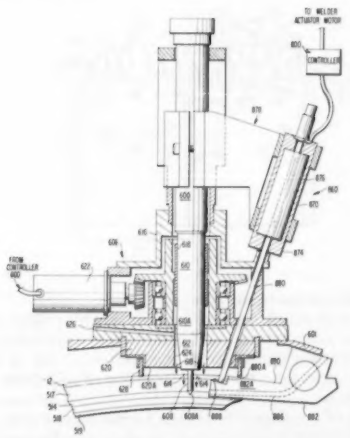
1. Nail set assembly for use as an overhead device in driving nails through the bottom planar portion of a U-shaped indentation in an aluminum soffit and into a supporting surface for the soffit, said U-shaped configuration characterized by a bottom planar portion and equally outwardly sloping planar sides extending downwardly therefrom and terminating at the soffit surface comprising in combination a punch holder and a punch, said punch holder comprising an elongated main body portion and an end portion integral with said main body portion for association with the said U-shaped indentation, said punch holder further comprising a main circular bore in said main body portion and a smaller circular bore communicating with said main bore and concentric therewith in said integral end portion and of a predetermined diameter to accommodate a nail head and an annular seat separating the main bore from the smaller bore, said punch holder end portion being of a conical shape tapering inwardly at a predetermined angle from the interface of the end portion with said main body portion toward the end of the end portion, said punch holder end portion having a pair of planar sides which taper inwardly toward one another at equal angles corresponding to the angles of the sloping planar sides of the U-shaped indentation and terminating at a planar elongated end surface lateral to the longitudinal centerline of the punch holder, support edges for the punch holder in said punch holder end portion and in the same lateral plane from which the said planar tapering sides depend for supporting the punch holder upright in the U-shaped indentation and the planar end surface of the punch holder against the bottom planar surface of the said U-shaped indentation whereby a nail will be driven into the soffit supporting surface at 90°, said support edges being in the same plane and parallel to the said elongated planar end surface, and said punch comprising an elongated cylindrically shaped blow receiving body portion and a smaller diameter cylindrically shaped concentric driving portion in longitudinal alignment and integral therewith, the blow receiving body portion being provided on its end with a planar surface perpendicular to the centerline of the body portion for receiving a blow by a driving device, a planar drive face on the end of the driving portion parallel to the planar blow receiving surface for contact with the nail to be driven, an annular seat separating said blow receiving body portion from said driving portion whereby forward movement of the punch is limited by said annular seat of the punch holder, the diameters of the circular bores being such as to accommodate the respective diameters of the punch and to allow freedom in longitudinal movement, the respective lengths of said driving portion of the punch and the smaller circular bore and the location of the shoulders on each being such that the planar drive face of the punch will be in the same plane as the planar end surface of the punch holder on the punch being at its forward extremity.

4,179,059

AUTOMATIC PIPE WELDING APPARATUS AND METHOD

Nuke M. Chang, Santa Anna, Calif.; John O. Emmerson, West Granby; Donald Ritchie, Ellington, both of Conn., and William Hollenbeck, Montrose, Calif., assignors to Santa Fe International Corporation, Orange, Calif.,

Filed Apr. 6, 1977, Ser. No. 785,219
Int. Cl.[2] B23K *9/12, 9/16, 9/02*
U.S. Cl. 228—103 **52 Claims**



1. An automatic pipe joint welding method, comprising the steps of:

placing one end portion of a pipe length provided with a machined reference surface thereon in facing relationship with one end of a second pipe length to define a weld zone therebetween, including said at least one reference surface;

mounting four rotatable welding heads spaced 90° from each other around the circumference of said pipes over said weld zone;

rotating said welding heads around the circumference of said pipes through an arc of about 180° to weld said facing ends to each other and so that the arc of travel of one of said heads at least significantly overlaps the arc of travel of an immediately preceeding one of said heads;

sensing the position of said welding head relative to said reference surface; and

adjusting said welding head relative to said weld zone depending on the sensed position of the welding head to maintain said welding head in substantially optimum relationship to said weld zone.

21. Apparatus for use in an automatic pipe welding system, in which a pair of pipe lengths are arranged to lie end to end to define a joint to be welded and wherein the welding system circumferentially traverses the pipe joint to be welded, comprising:

means defining a welding chamber around said joint;

at least one welding torch mounted for circumferential movement relative to said pipe lengths, said torch having a welding electrode extending into said welding chamber for heating a weld zone to form a weld puddle at said joint;

means for introducing a flow of inert gas around the electrode to provide a gas shield in the region of the weld zone adjacent said electrode; and

means for pressurizing said welding chamber with a fluid so as to exert a force on the gas shield, said force being transmitted by the gas shield to the weld zone to cause a puddle-pushing effect on the weld puddle which tends to displace weld material toward the interior of said pipe joint.

4,179,060

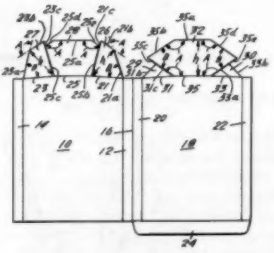
DISPLAY CARTON

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 860,563, Dec. 14, 1977, abandoned. This application Jun. 23, 1978, Ser. No. 918,692

Int. Cl.[2] **B65D** *5/00*

U.S. Cl. 229—8 **4 Claims**



1. A display carton blank, comprising:

front and back panels separated at one side by a hinge line;

a hexagonal outer bottom panel in the shape of the bottom of said carton and hinged from the bottom of one of said panels chosen from the class consisting of said front and back panels;

a plurality of overlappable bottom panels hinged from the bottoms of said front and back panels to overlie said bottom panel,

said hexagonal outer panel being irregular and hinged by a first edge to the center of the bottom edge of a first one of said front and back panels, the edges of said outer panel being numbered in sequence with said first and fourth edges being equal in length and parallel, the longer edges separated by a distance h, the second, third, fifth and sixth edges being equal, the internal angles B between the second and third edges and between the fifth and sixth edges being equal and acute, the remaining internal angles A being equal and obtuse;

first and second said identical overlappable panels each being shaped as a quadrilateral with its edges consecutively numbered starting with the hinged edge which is hinged to the sides of the bottom edge of the second one of said front and back panels, the first and second edges being equal in length to said second and third edges of said hexagon panel, the internal angles between said first and second edges being equal to B, and the internal angles between said second and third edges being equal to A;

a third said overlappable panel in the shape of an irregular hexagon, the edges of which are consecutively numbered, with the first edge hinged to the center of the bottom edge of the second one of said front and back panels, the first and fourth edges being parallel and equal in length to the longer side of said outer hexagonal panel, the internal angle between the third and fourth edges and between the fourth and fifth edges being equal to A, the second and fifth edges being colinear with but separated from said fourth edges of said first and second overlappable panels; and,

fourth and fifth identical said overlappable panels each triangular shaped and having consecutively numbered edges, with the first said edges hinged to the sides of the bottom edge of said first one of said front and back panels, said first edges being equal to the shorter edges of said outer hexagonal panel, said third edges being colinear but separated from the second and fifth edges of said outer hexagonal panel, the lengths of said second and third edges being such that the areas of said fourth and fifth panels are substantially equal to the portions of the areas of said first and second overlappable panels which are exposed to be attachable to said outer hexagon panel when said blank is erected.

4,179,061

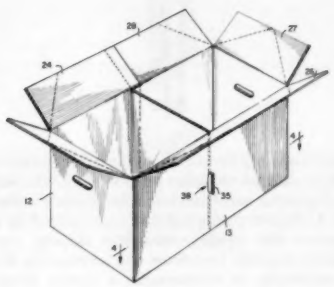
PARTITIONED CONTAINER

Earl F. Gilbert, Farmington Hills, Mich., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 5, 1978, Ser. No. 948,818

Int. Cl.[2] **B65D** *5/42, 5/48*

U.S. Cl. 229—27 **1 Claim**



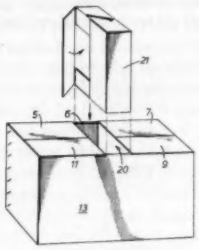
1. A collapsible, partitioned container prepared from a single blank of corrugated paperboard or the like comprising a first half side panel, a first end panel, a full side panel, a second end panel, a second half side panel and a partition panel connected in series, said series of hinged panels defining the primary walls and an integral partition panel for said container, top and bottom closure flaps foldably attached to the ends of said primary walls, and means for adhering the terminal edge of the first half side panel to the edge of said second half side panel adjacent to said partition panel, the improvement comprising means for releasibly locking said partition panel between the side walls formed by the first and second half side panels and the full side panel of said container, said means comprising cooperating elements located on the end of said partition panel and in said full side wall panel for retaining said partition panel in position said means consisting of at least one locking tab element integral with said partition panel and extending beyond the end of said partition panel and at least one locking slot located in said full side panel.

4,179,062

CARTON BLANKS AND CARTONS MADE THEREFROM

Brian G. Baker, 32, Shaftsbury Cir., South Harrow, Middlesex, England

Filed Feb. 27, 1979, Ser. No. 15,627
Claims priority, application United Kingdom, May 31, 1978, 25010/78
Int. Cl.[2] B65D 5/02
U.S. Cl. 229—37 R 7 Claims



1. A carton blank comprising a substantially rectangular portion having first, second, third and fourth flaps along one major side of said substantially rectangular portion and, along the opposite major side of said substantially rectangular portion, a first flap directly opposite said first flap on said one major side and extending along a shorter length of said rectangular portion than does said first flap on said one major side, and a second flap directly opposite said third flap on said one major side and extending along a shorter length of said rectangular portion than does said third flap on said one major side, said flaps on said opposite major side being symmetrically disposed about a straight line which extends at right angles across said rectangular portion and passes centrally through said second flap on said one major side; the blank further comprising fold lines which extend across said substantially rectangular portion at right angles to said one major side from between the adjacent flaps on said one major side, the carton blank being such that, when the flaps are folded to form a carton, the carton comprises a defined volume which can receive goods sized in accordance therewith and be sealed and further comprises an open slot beside said defined volume into which slot another, smaller carton can be slotted at a later date and sealed in position.

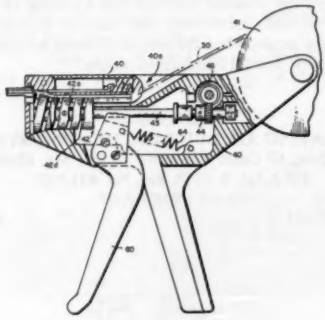
4,179,063

FEED AND SEVERING APPARATUS

David B. Russell, Southboro, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation-in-part of Ser. No. 671,518, Mar. 29, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,249
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.[2] B25C 1/00
U.S. Cl. 227—67 15 Claims

1. In a machine for dispensing fasteners, each having a pair of side members cross coupled by a link member, the improvement comprising means for advancing connected plurality of the fasteners to a position for being dispensed and means on the



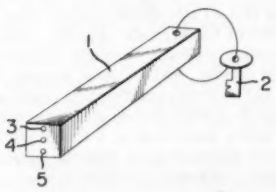
advancing means for severing each of said side members without interrupting the advance of said side members.

4,179,064

VENDING APPARATUS

Toshihiro Yoshioka, Katano; Tasuku Ishimoto, Toyonaka; Hiroshi Yamane, Hirakata; Takahiro Kita, Osaka, all of Japan, and Matsushita Reiki Corp., Ltd., 03, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd.

Filed Mar. 16, 1977, Ser. No. 778,110
Claims priority, application Japan, Mar. 18, 1976, 51-30122; Mar. 19, 1976, 51-30194
Int. Cl.[2] G07F 7/08; G06K 19/06
U.S. Cl. 235—381 14 Claims



1. An article vending and accounting system, comprising
(a) a plurality of vending machines each containing different kinds of merchandise which may be freely selected by a customer,
(b) a merchandise code generator disposed within each vending machine for generating a merchandise code of a merchandise item selected by the customer,
(c) first connection means disposed within each vending machine,
(d) a plurality of memory holders each of which may be carried by a customer for permitting the selection of merchandise when connected to said first connection means,
(e) memory means such as a shift register disposed within each of said memory holders for storing therein the merchandise code transmitted from said merchandise code generator,
(f) means for transmitting the merchandise data generated by the code generator,
(g) switching means disposed within each memory holder for enabling the storage in and read out from said memory means of merchandise data transmitted from said merchandise code generator when said switching means is activated,
(h) an accounting machine for reading the merchandise

codes stored in said memory means in the memory holder when connected thereto for preparing a bill, and

(i) actuating means disposed adjacent to said first connection means of the vending machine and a second connection means of said accounting machine for activating said switching means when the memory holder is connected to said first or second connection means.

4,179,065

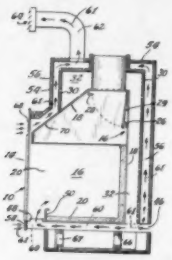
CIRCULATING AIR BUILDING HEATING SYSTEM

Joseph T. Zung, 65 Cedar Grove Rd., Rolla, Mo. 65401

Filed Jul. 5, 1978, Ser. No. 921,980

Int. Cl.[2] F24B *7/02*

U.S. Cl. 237—51 **8 Claims**



7. In a circulating-air building temperature control system including means defining a pumped air circulation conduit for distributing controlled temperature air throughout the building and collecting return air, and a heating unit positioned within the air circulation conduit comprising a fireplace chamber for burning solid fuel, defined by the fireplace chamber walls, a portion of said air circulation conduit being positioned about the exterior of the fireplace chamber walls, chimney means communicating with said fireplace chamber through said air circulation conduit, and an outer housing defining an outer chamber and enclosing said fireplace chamber and the pumped air circulation conduit portion adjacent said fireplace chamber, air inlet means positioned at a lower portion of said outer housing and communicating with the outer chamber, and air outlet means positioned at an upper portion of said outer housing and communicating between said outer chamber and an indoors location for receiving hot air from said outlet means, to serve as an automatic means for cooling said air circulation conduit portion while warming the building by convective circulation, and a pair of combustion air conduits communicating between said fireplace chamber and the exterior of said heat unit, said combustion air conduits passing underneath said fireplace chamber in communication with said fireplace chamber at a front location of the bottom wall thereof, said air inlet means comprising a conduit defining an air inlet in a front location of said fireplace chamber and passing between the respective combustion air conduits under the bottom wall of said fireplace chamber into communication with said outer chamber at a lower location thereof in which an added inlet is positioned adjacent said upper portion of said fireplace chamber to direct air along at least a portion of the top wall of said fireplace chamber for removal of heat therefrom, said added air inlet communicating with said air outlet means.

4,179,066

MEANS FOR JOINING TOY TRACK SECTIONS

Edward C. Teter, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,741

Int. Cl.[2] A63H *19/30, 18/02*

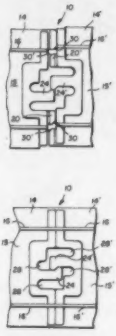
U.S. Cl. 238—10 E **6 Claims**

1. Joining means on end portions of an elongated molded toy track section for interlocking with end portions of adjoining track sections to form a track for a train, comprising:

a longitudinally extending first projection on each of said end portions of said track section insertable into a complimentary recess in an end portion of an adjoining track section;

a longitudinally extending first recess on each of said end portions laterally spaced from said first projection for receiving a complementary projection on the end portion of the adjoining track section; and

a flexible latch member on each of said end portions having



a free end part for engaging and retaining a free end part of a complementary flexible latch member on the end portion of the adjoining track section for releasably securing said track section to the adjoining track section, each of said latch members comprising a longitudinally extending flexible finger defined by a pair of laterally spaced apart, longitudinally extending blind slots extending from the end of each end portion for laterally spacing said finger from said first projection and first recess, said slots further extending completely through each of said end portions in a direction transverse to the length of said track section.

4,179,067

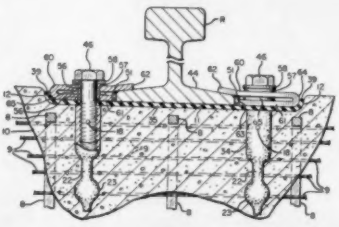
RAILWAY TRACK HOLD-DOWN HARDWARE

Ludwig S. Baier, 9998 French Prairie Dr., Wilsonville, Oreg. 97070

Continuation-in-part of Ser. No. 716,269, Aug. 20, 1976, abandoned, and Ser. No. 774,741, Mar. 7, 1977, abandoned. This application Feb. 1, 1978, Ser. No. 874,257

Int. Cl.[2] E01B *3/34, 9/28, 9/30, 9/62*

U.S. Cl. 238—91 **6 Claims**



1. A railway rail holding assembly comprising a molded base member having a depression in its top surface with side walls on opposite sides of the rail; a pad of cushion material adhered in said depression with the ends of the pad bent upward to cover said side walls, the molded material of said base member being heat cured and said pad being adhered to said base member while said base member is warm from heat curing, grooves

in the top surface of said pad in an area of the pad in contact with the rail; a pair of elongated vertical tubular nuts embedded in said base member with their upper ends underlying said pad on opposite sides of the rail, each tubular nut having a reduced cylindrical neck portion connecting the upper end of the nut with a lower end which is thicker and wider than said neck and which is transversely flattened at its lower extremity, a corrosion preventing coating on said tubular nuts, and sand adhered to said coating to provide a bond between said tubular nuts and said molded material of said base member; an apertured clip on said pad on each side of the rail, one end of each clip bearing against said pad on said side wall of the depression and the opposite end of the clip bearing against the top of the rail flange and having a vertical abutment surface confronting an edge of the rail flange; a bolt extending through the aperture in said clip and having threaded engagement in said tubular nut; aligned radial threaded holes in opposite sides of said tubular nut containing threaded plastic plugs having inner ends frictionally engaging threads on said bolt to prevent rotation of the bolt, the outer ends of said plugs being flush with the outer surface of said tubular nut and engaging the molded material of said base member, said plastic plugs being spaced from the upper end of said nut so that they are not engaged by a threaded tool which positions the upper end of the nut in a mold for said base member when the base member is molded; and bolt holes in said pad of smaller diameter than said bolts causing said pad to grip the bolts and assist in preventing rotation of the bolts in service.

4,179,068

LIQUID SPRAY DEVICES

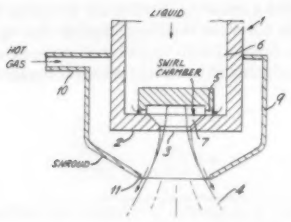
Norman Dombrowski, Leeds, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 708,735, Jul. 26, 1976, abandoned. This application Jul. 20, 1978, Ser. No. 926,335

Claims priority, application United Kingdom, Jul. 24, 1975, 31000/75

Int. Cl.[2] B05B *1/24*

U.S. Cl. 239—13 **13 Claims**



1. A device for spraying liquid in droplet form through a first and movable atmosphere onto receiving surfaces and for reducing the quantity of small sized droplets relative to a spectrum of droplet sizes sprayed by the device to reduce the tendency of the droplets to be disturbed by air currents, said device comprising:

an orifice;

means to emit only liquid from said orifice in the form of a non-atomized thin sheet of a kind that, in the absence of further treatment, breaks down after a time interval within said first atmosphere into droplets falling within a spectrum of sizes;

means to contact said sheet close to said orifice and before said sheet breaks down with a second atmosphere comprising hot gas, whereby said time interval is shortened and the proportion of small droplets is diminished, and

outlet means for discharging said liquid from said device to proceed toward said receiving surfaces.

4,179,069

ELECTROMAGNETICALLY OPERATED FUEL INJECTION VALVE

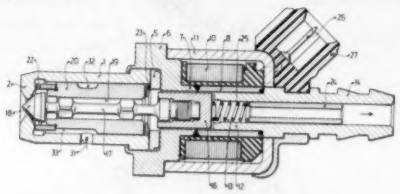
Heinrich Knapp, Leonberg, and Waldemar Hans, Bamberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,231

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725135

Int. Cl.[2] B05B *1/32*

U.S. Cl. 239—125 **10 Claims**



1. Electromagnetically operated fuel injection valve to inject fuel into a plenum of an internal combustion engine comprising

an elongated valve body (**1, 6**) having a fuel supply inlet (**31**) and a fuel drain outlet (**14**);

an operating magnet (**10**) located in said body;

means (**33, 34, 35, 30, 19, 24**) formed in said body and providing a continuous fluid path between the supply inlet and the drain outlet,

said fluid path including a chamber (**30**) formed in the valve body and connecting means (**35**) leading to the chamber inclined with respect to the walls of the chamber to establish a swirling fluid flow therein;

a nozzle (**3**) in fluid communication with said fluid path, positioned at an end portion of the valve body and located adjacent the chamber (**30**);

a movable, dual valve function valve element (**17, 18**) coupled to said magnet and, to carry out one function, selectively, closing off said nozzle (**3**) and operable to open a flow path through said nozzle upon energization of the magnet;

and an auxiliary valve (**40, 41**) having a movable portion (**40**) secured to and moving with said valve element (**17, 18**) to carry out the second function, located downstream of the nozzle (**3**), and a fixed valve portion secured in said valve body, the auxiliary valve interrupting the fluid flow path between the fluid inlet (**31**) and the drain outlet (**14**) when the valve element is in a position to open the flow path through the nozzle, and permitting fluid flow between the fuel inlet and the drain outlet when the valve element (**17, 18**) closes off the fluid flow path through the nozzle.

4,179,070

SPRAYER

Tetsuya Tada, 6-3, 2-chome, Kakinokizaka, Meguro-ku, Tokyo, Japan

Filed Nov. 21, 1977, Ser. No. 853,535

Claims priority, application Japan, May 9, 1977, 52/52886; May 19, 1977, 52/64321[U]

Int. Cl.[2] B05B *9/04*

U.S. Cl. 239—333 **7 Claims**

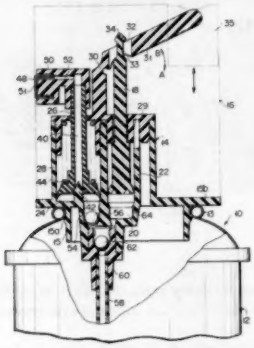
1. In a sprayer having a body which comprises a piston slidably received in the body; a pressurizing cylinder for defining a liquid receiving pressurized chamber together with the piston; a valve rod slidably received in the body; a pressure accumulating cylinder for defining a liquid receiving pressure accumulating chamber together with the valve rod; nozzle means having an ejection hole communicating with the pressure accumulating chamber; and biasing means disposed in the pressure accumulating cylinder to bias the valve rod;

the improvement wherein:

the pressurizing cylinder and the pressure accumulating cylinder are arranged substantially in parallel;

the pressure accumulating chamber has a larger diameter than the diameter of the pressurizing chamber; and

the sprayer body further comprises a lever rotatable about a pivotable point lying substantially between the pressurizing and pressure accumulating cylinders; a vertically



movable push button disposed adjacent to and substantially in parallel with the pressurizing cylinder and drivingly connected to the free end of the lever, and a stationary check valve coupled between the pressurizing chamber and the pressure accumulating chamber for communicating the chambers with each other and for preventing liquid from flowing backward from the pressure accumulating chamber to the pressurizing chamber.

4,179,071

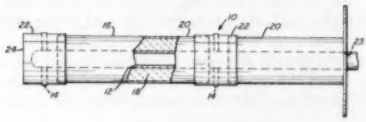
INDUSTRIAL SULFUR TRIOXIDE GAS INJECTION PROBE AND METHOD OF MANUFACTURE

Wayne R. Kozacka, Laguna Hills, Calif., assignor to Wahlco, Inc., Santa Ana, Calif.

Filed Jul. 7, 1978, Ser. No. 922,770

Int. Cl.[2] B05B *1/14;* B32B *31/06*

U.S. Cl. 239—397.5 **7 Claims**



1. An industrial sulfur trioxide gas injection probe comprising: an elongated outer metallic sheathing portion; an elongated sulfur trioxide gas conveying pipe having at least a major portion thereof received within said sheathing portion; the outer diameter of said conveying pipe being less than the inner diameter of said sheathing portion; a refractory disposed intermediate the adjacent peripheral surfaces of said pipe and said sheathing portion; said refractory being disposed between said adjacent surfaces as a poured refractory and thereafter being allowed to set up to uniformly fill the space between said adjacent surfaces; the outer diameter of said refractor and the outer diameter of said sheathing portion being constant through the respective major longitudinal extents thereof; and a plurality of longitudinally spaced generally transversely extending sulfur trioxide gas injection nozzles communicating between the interior of said pipe and the exterior of said sheathing portion.

4,179,072

FUEL INJECTOR

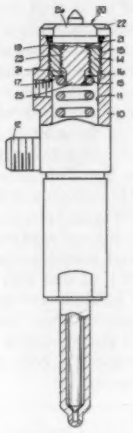
Donald Worby, Stonehouse, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 31, 1978, Ser. No. 873,780

Claims priority, application United Kingdom, Feb. 12, 1977, 6007/77

Int. Cl.[2] B05B *1/30;* F16K *21/10*

U.S. Cl. 239—533.9 **2 Claims**



1. A fuel injector comprising a body having a bore therethrough, a seating, a valve member slidable within the bore and co-operating with the seating to control the flow of fuel therepast, means biasing the valve member into engagement with the seating, a collar disposed in the bore and having internal and external screw-threading thereon, the external screw-threading being engaged with complementary screw-threading on the interior of the bore, rotation of the collar relative to the body being arranged to adjust the biasing force of the biasing means, and a retaining member for retaining the collar in position in the bore, the retaining member having external screw-threading engaged with the internal screw-threading on the collar and including an abutment which is engageable with the body.

4,179,073

DRIVING UNIT FOR AN OSCILLATING SPREADING PIPE OF A DEVICE FOR DISTRIBUTING MATERIAL

Pieter A. Oosterling, and Hermanus H. Vissers, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Feb. 24, 1978, Ser. No. 881,062

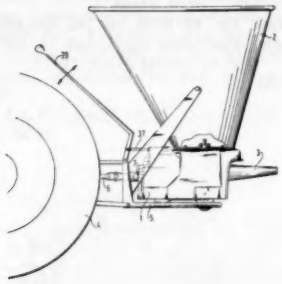
Claims priority, application Netherlands, May 5, 1977, 7704974

Int. Cl.[2] A01C *3/06*

U.S. Cl. 239—659 **11 Claims**

1. A driving unit supported by a frame for the oscillating distributing pipe of a device for spreading material, for example, fertilizer, said unit mainly comprising a drivable fly-wheel, a distirbuting-pipe holder to be oscillated by the fly-wheel through a coupling element eccentrically journalled in said fly-wheel and a dosing mechanism arranged above said holder,

characterized in that a portion of the frame extends in a dish-shaped fashion on either side of the driving unit, said dish-



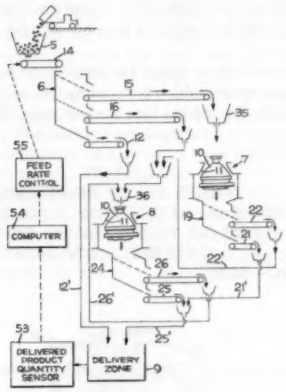
shaped portion having an opening receiving and locating said dosing mechanism.

4,179,074

METHOD OF CONTROLLING FEED RATE TO CRUSHING PLANT WHILE CRUSHERS ARE ADJUSTED TO CONTINUALLY OPERATE AT FULL POWER

Malcolm D. Flavel, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 30, 1978, Ser. No. 938,259
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—24 **11 Claims**



1. A method of controlling operation of a crushing plant having a crushing mechanism (7 and 8) for which a predetermined amount of power is constantly available, means (14) for feeding raw material to the crushing mechanism (7 and 8) at a controllably variable feed rate, and a delivery zone (9) to which product material of less than a predetermined particle size is delivered, said method enabling a predetermined quantity of product material to be delivered to the delivery zone (9) during a predetermined working period while also ensuring that the product material delivered to said zone (9) during said period is of optimum economic value by reason of having the smallest particle size attainable within the constraints imposed by said predetermined quantity and the available power, said method being characterized by:

A. at each of a plurality of measurement times during the working period

(1) ascertaining the quantity of material that has been delivered to the delivery zone (9) from the beginning of the working period to the measurement time, and

(2) by reference to

(a) the amount of material that still needs to be delivered to the delivery zone (9) to make up said predetermined quantity,

(b) the time remaining from the measurement time to the end of the working period, and

(c) the rate at which raw material was being fed to the crushing mechanism (7,8) during an interval immediately preceding the measurement time,

adjusting the rate of feed (at 14) of raw material to the crushing mechanism (7,8) to a value which, if maintained to the end of the working period, is calculated to cause said predetermined quantity of material to have arrived at the delivery zone (9) by the end of the working period; and

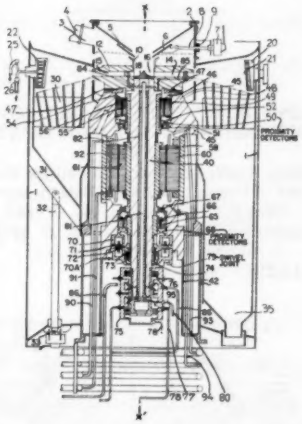
B. at all times so controlling the crushing mechanism (7,8) as to cause it to consume the full amount of power available to it while it continues to process material at substantially the prevailing feed rate.

4,179,075

VACUUM-SPRAYING GRINDER

Claude Rachais, Paris, France, assignor to Creusot-Loire, Paris, France

Filed Nov. 9, 1977, Ser. No. 849,981
Claims priority, application France, Nov. 23, 1976, 76 35175
Int. Cl.[2] B02C *19/00*
U.S. Cl. 241—67 **8 Claims**



1. A vacuum-spraying grinder in which material to be ground is sprayed by centrifugal force on to an impact surface, said grinder comprising:

a fixed chamber;

means connected to said chamber for connection to suction means so that the chamber is under suction pressure;

a target mounted in said chamber comprising a ring having an impact surface directed inwardly of said chamber, said impact surface having a vertical axis of symmetry of revolution;

a rotor located at least partially in said chamber and defining a vertical axis of rotation coincident with said axis of symmetry of revolution of said impact surface of said target, said rotor comprising an upper part in the form of a horizontal disc defining radial channels which communicate with a central orifice provided in the upper part of said disc, and a lower part in the form of a vertical shaft for the support and drive of said rotor, said disc being located at the level of said target and inside the space defined by said impact surface thereof;

means for feeding material to be ground to said central orifice of said disc and permitting continuous feeding of said grinder;

means for removing ground material from the lower end of said vacuum chamber; and

means for supporting, driving and guiding said shaft of said rotor comprising:

at least one active radial magnetic bearing comprising a stator surrounding said shaft over a part of the height thereof, and a rotor carried by said shaft in spaced relation with said stator;

an active axial magnetic stop comprising a movable part carried on said shaft and a fixed part located in spaced relation opposite said movable part of said stop;

radial and axial position detector means for detecting the radial and axial positions of said shaft, said detector means being connected to circuit means for controlling the energization of said stator of said magnetic bearing and said magnetic stop in accordance with output signals from said detector means to compensate any unsymmetrical wear of said rotor by shifting of the rotor within the space between the stator and rotor of the radial magnetic bearing;

an electric motor comprising a stator surrounding said shaft over a part of the height thereof and a rotor mounted on said shaft in spaced relation with said stator; and

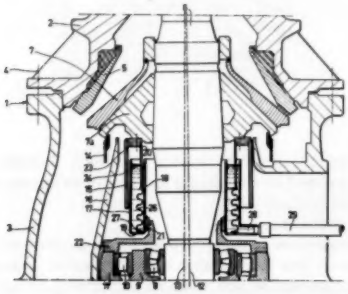
ball bearing means, mounted around said shaft and on which said shaft rests when it is not in operation.

4,179,076

SEALING DEVICE BETWEEN THE MOVABLE CRUSHING MEMBER AND THE BODY OF A GIRATORY CRUSHER

Jean C. Barrot, Neuilly-sur-Seine, and Philippe Pulido, Aubervilliers, both of France, assignors to Babbitless, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,605
Claims priority, application France, Jul. 27, 1977, 77 23143
Int. Cl.[2] B02C *2/04*
U.S. Cl. 241—216 **9 Claims**



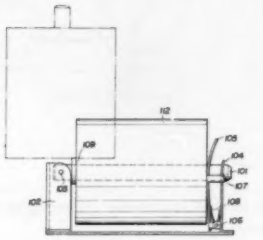
1. In a gyratory crusher comprising a shaft line supporting a movable crushing member within a body of the gyratory crusher, the said shaft line being able to be actuated with a pendulum movement, a rotary movement, and an axial translatory movement relative to the body; a sealing device comprising an annular chamber carried by the body, surrounding the volume swept out by the shaft line in the course of its pendulum movement, open upwards and containing a liquid, and a substantially cylindrical rigid wall carried by the movable shaft line, and projecting downwards into the liquid in the chamber, the width of this chamber being greater than the amplitude of the pendulum movement of the shaft line at the level of the said wall, with the improvement that the said rigid wall is extended downwards, around all its periphery, by a flexible skirt.

4,179,077

DEVICE FOR LOADING A PAPER ROLL

Taneji Morishita, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1978, Ser. No. 896,239
Claims priority, application Japan, Apr. 21, 1977, 52-49528
Int. Cl.[2] B65H *23/08, 19/10*
U.S. Cl. 242—55 **5 Claims**



1. A device for loading a paper roll, comprising:

a first support member;

a center shaft adapted to be fitted into the center hole of the paper roll, one end of said center shaft being pivotally supported with the first support member;

a second support member having a part for holding the other end of the center shaft;

pressure means having a face able to contact with one side of the paper roll;

spring means for urging said pressure means in the direction toward the first support member around at least one fulcrum;

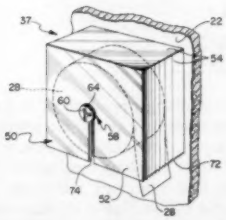
at least one stopper means for limiting the movement of said pressure means which is urged by said spring means in the direction toward the first support member.

4,179,078

TOILET PAPER DISPENSER

Donna J. Mansfield, 292 D Meridian St., Groton, Conn. 06340

Filed Oct. 10, 1978, Ser. No. 949,700
Int. Cl.[2] B65H *19/04, 19/00*
U.S. Cl. 242—55.53 **18 Claims**



1. Toilet paper dispensing apparatus comprising:

a support plate adapted to be mounted to a wall and having portions contiguous with the wall when mounted thereon;

a spindle mounted to said plate having a longitudinal axis transverse to a plane of said contiguous portions, said spindle adapted to freely receive thereon a roll of toilet paper;

retainer means removably mounted to said spindle adjacent to a free end of said spindle for retaining the roll in position on said spindle; and

locking means cooperatively associated with said retainer means and said spindle for releasably securing said retainer means on said spindle.

4,179,079

PROCESS AND AN APPARATUS FOR LOADING A CASSETTE WITH AN ENDLESS ROLL

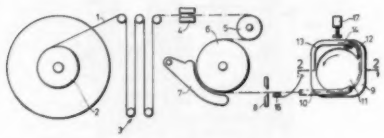
Heinz Johanns, Leverkusen, Fed. Rep. of Germany, assignor to AGFA-Gevaert A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,520

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733585

Int. Cl.[2] **B65H** *19/20, 35/02, 17/02*

U.S. Cl. 242—56 R **4 Claims**



1. A method for loading a cassette with an endless roll from a cut length of film strip disposed in a supply plane having a pair of ends which

(a) one end of film strip is supplied and led, with deflection into a coiled path, into a stationary track, which is laterally offset from the supply plane by a film width and corresponds to the path of the film guide passage of a cassette from the outer winding of a roll to its film gate, the coiled one end is then fixed at the end of the track, an adhesive surface of the one end of the film strip being kept free for adhesive tape;

(b) with the coiled deflection maintained, a further portion of the film strip is supplied and is wound into a coiled roll, from the outside to the inside, within a rotating winding chamber which is joined to the track, and corresponds to the film take-up in a cassette; bringing the film strip to a stand still upon completion of the winding process and cutting it off and simultaneously displacing the cut end laterally by a film width along a contour corresponding to the film guide passage of a cassette, from the inner winding of the coiled roll around the side of the roll to its film gate and pushing it in front of and in line with the said one end of the film strip, where the ends of the film strip are spliced to form an endless roll with the aid of an adhesive tape, and the endless roll is then pushed into a parallel open film cassette by means of an ejector.

4,179,080

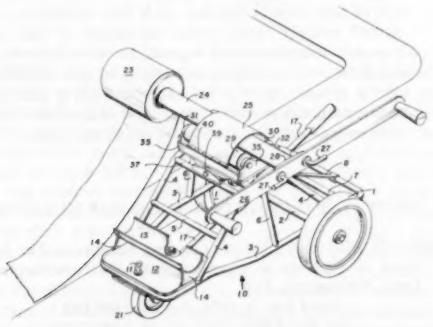
DOLLY

Henry A. Patnaude, 831 Los Molinos Way, Sacramento, Calif. 95825

Filed Apr. 12, 1978, Ser. No. 895,800

Int. Cl.[2] **B65H** *17/46, 75/40*

U.S. Cl. 242—86.52 **5 Claims**



1. A dolly comprising a substantially rectangular lower frame member having a tapered front portion, an axle rearwardly disposed on said frame to carry two wheels, a pair of inverted U-shaped frame members which are connected to said lower frame member and provide a support structure for upper frame members, a housing nested on an upper portion of said upper frame members, a pair of rollers disposed within said housing on a roller carriage, a cover carrying pole overlying said rollers, and a shroud overlying said pole to provide a latched safety catch and to prevent the cover carrying pole from being dislodged from the roller carriage, a flexible rear suspension means for dissipating shock loads throughout the frame members, said rear suspension means includes a resilient tie bar connecting each inverted U-shaped frame member to said lower frame member through a sleeve on the inverted frame, U-shaped frame member and lower frame and a pivot carried at each extremity of said resilient tie bar, and a handle means disposed at both extremities of said cover carrying pole defined by a flanged end of said cover carrying pole fastened to an elongate crank handle member substantially medially along said handle member's elongate extent and lock handle means releasably fastening said flange to said elongate crank handle member used when paying out the cover, and a front wheel disposed at the bottom of and in the front of said lower frame member.

4,179,081

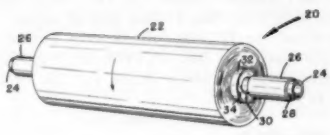
APPARATUS FOR APPLICATION OF PLASTICS STRETCH FILMS

John C. Parry, 6729 Brookmont Dr., Baltimore, Md. 21207

Filed Jun. 12, 1978, Ser. No. 914,801

Int. Cl.[2] **B65H** *17/44*

U.S. Cl. 242—99 **11 Claims**



1. An apparatus for manually applying plastics stretch films for packaging units consisting of:

a core for a roll of plastics stretch film, said core having extended ends; and

a pair of flexible hand grips removably encircled about the ends of said core for control of the tension on said plastics stretch film while unrolling during manual application for packaging, said core having an outside diameter essentially the same as the inside diameter of said flexible hand grip so that inside surface of said flexible hand grip slidingly interfaces with the outside surface of said core.

4,179,082

BOBBIN HOLDER

Takeshi Suzuki, 19, Hacchodori, 4-chome, Toyohashi-shi, Aichi-ken, Japan

Filed Mar. 29, 1978, Ser. No. 891,181

Int. Cl.[2] **B65H** *54/54, 54/74, 79/00*

U.S. Cl. 242—129.51 **5 Claims**

1. A bobbin holder, comprising:

a bushing having an interior cavity with a cylindrical wall adjacent one end thereof;

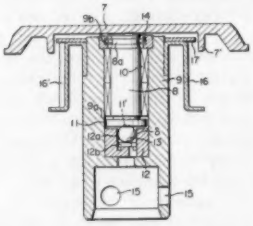
a shaft disposed in said cavity with a free end of said shaft extending from said end of said bushing and the other end of said shaft adjacent an interior supporting surface within said cavity;

bearing means disposed between the peripheral surface of said shaft and the cylindrical wall of said cavity;

means for securing a bobbin holder to said free end of said shaft;

a thrust receiving ball disposed in contact with said interior supporting surface;

a thrust receiving plate disposed between said ball and said other end of said shaft; and



a peripheral protective flange secured to said bushing adjacent said one end thereof, said flange having a plurality of protrusions for cutting and undoing any yarn which may become wound around said flange.

4,179,083

WIRE FORCING DEVICE FOR A WIRE TAKE UP APPARATUS

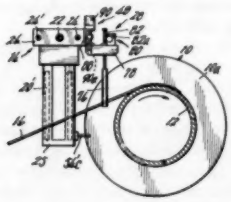
Ryoichi Hara, Chiba; Masamichi Yajima; Chiaki Akai, both of Ichihara, and Takuzo Matsumoto, Osaka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Division of Ser. No. 772,339, Feb. 25, 1977, Pat. No. 4,143,834. This application Dec. 13, 1978, Ser. No. 968,975

Claims priority, application Japan, Feb. 25, 1976, 51-20521; Feb. 25, 1976, 51-20522

Int. Cl.[2] **B65H** *54/28*

U.S. Cl. 242—158 R **3 Claims**



1. A distributor for use with a take up apparatus which winds wire onto a reel with flanges at each end, said distributor comprising:

at least one pair of rotatable guide rollers adjacent said reel, one roller on each side of said wire;

carriage means carrying said guide rollers thereon for moving said rollers parallel to the longitudinal axis of said reel;

a single vertically movable wire engaging roller between said guide rollers and said reel;

adjustment means connected to said wire engaging roller for moving said roller up and down beside said wire; and

urging means operatively connected to said carriage means and said wire engaging roller for selectively positioning said wire engaging roller on the side of said wire opposite the side of said wire approaching one of said flanges as said wire is wound on said reel and for urging said wire engaging roller and said wire toward said flange approached by said wire after said engaging roller has been positioned next to said wire by said adjustment means.

4,179,084

FISHING REEL

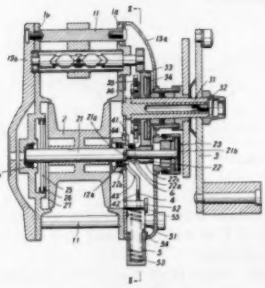
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 4, 1978, Ser. No. 902,698

Claims priority, application Japan, May 9, 1977, 52-53317

Int. Cl.[2] **A01K** *89/00, 89/02*

U.S. Cl. 242—212 **5 Claims**



1. A fishing reel comprising;

first and second spaced apart side plates arranged in parallel with one another;

a spool shaft rotatably journalled between said first and second side plates;

a spool mounted to said spool shaft for rotation therewith;

a handle shaft supported to said first side plate;

a mechanism for transmitting the driving force from said handle shaft to said spool shaft comprising a driving gear and a clutch in mesh therewith, said clutch being axially movable and rotatable with respect to said spool shaft; and

a clutch control mechanism for controlling said clutch, said clutch control mechanism comprising, means for reciprocally mounting a clutch lever to said first side plate, a control member for controlling movement of said clutch lever and having a holding face, a clutch holder connected to said clutch for moving said clutch axially of said spool shaft to thereby disconnect said clutch from said spool shaft, and a return plate rotating together with said handle shaft and having projections thereon for restoring said clutch lever to its original position, said clutch holder being biased by means of springs to urge said clutch into engagement with said spool shaft and said clutch lever against an outside surface of said first side plate, said clutch lever comprising control arms and a guide in parallel with said first side plate, each of said control arms having a slant face formed at a bent portion thereof, said slant face causing said guide to be displaced from said first side plate, said clutch lever being received by said holding face of said control member such that operation of said control member causes initial movement of said clutch lever in a direction which is parallel to said first side plate and subsequent swinging movement of said clutch lever axially of said return plate, thereby shifting said clutch lever to a position where the utmost ends of said control arms engage with projections of the return plate.

4,179,085

OPTICAL BORESIGHT METHOD FOR NUTATING SYSTEM

Walter E. Miller, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,580

Int. Cl.[2] **F41G** *3/32, 11/00, 1/00, 1/54*

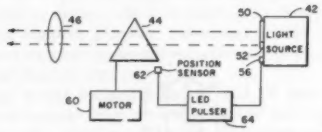
U.S. Cl. 244—3.11 **5 Claims**

1. In a beamrider guidance system wherein rotation of a

nutating device moves an optical beam to periodically vary the inclination of the beam axis, a method for determining and maintaining boresight alignment of the nutating system with an adjacent optical telescope on the same stable platform comprising the steps of:

directing a beam of optical energy generated by said guidance system through said nutating mechanism;

emitting rapid, brief, directional flashes of visible light through said nutating mechanism at preselected points around the plane of rotation of the nutating device for



providing a visible optical reference in said modulated beam for identifying said boresight;

nutating said beam;

retro-directing a portion of said beam in a plane parallel to and opposite in direction to said directed beam;

capturing said retro-directed beam in a telescope;

displaying said retro-directed beam on the focal plane of said telescope; and

observing said directional flashes of optical energy displayed on said telescope focal plane for identifying the beamrider guidance system boresight.

4,179,086

ARMY RESTRAINT SYSTEM

Edwin Y. Yamada, Orange, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 20, 1978, Ser. No. 926,361
Int. Cl.[2] B64D *25/02*
U.S. Cl. 244—122 AG **2 Claims**

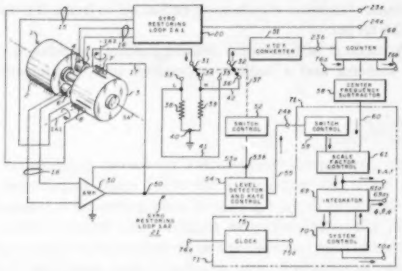
1. In combination, an aircraft ejection seat holding a crewman therein and an arm restraint system for use therewith comprising, a restraint strap, a first ring member fixedly attached to the upper back rest of the ejection seat, a foldable shoulder flap attached to the side of the outer garment of the crewman in the lower shoulder area, a second ring member attached to a seat belt around the crewman's abdomen, and a third ring member attached to the lower side portion of the ejection seat, said restraint strap extending through said first ring member, past said foldable shoulder flap through said second ring member, back past said foldable shoulder flap through said third ring member, said shoulder flap being folded upward to slidably dispose said restraint strap therein whereby retraction of said restraint strap causes said foldable shoulder flap to unfold allowing the strap to slide down the crewman's arm so that further retraction operates to press the arm tightly against the body thereby preventing flailing of the crewman's arms during and immediately after ejection.

4,179,087

GYROSCOPE RATE RANGE SWITCHING AND CONTROL SYSTEM

James S. Johnson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 2, 1977, Ser. No. 847,861
Int. Cl.[2] G01C *19/28*
U.S. Cl. 244—175 **14 Claims**



1. In an inertial reference system for aircraft, apparatus for adapting the full angular rate range characteristics of a rebalanceable rate gyroscope, having pick off means and rebalancing torquer means, to operation with converter means having a limited precision conversion range, said apparatus comprising:

amplifier means responsive to said pick off means for supplying a rebalancing torquing current to said torquer means,

first and second impedance means having different characteristic impedance values,

switch means for selectively placing said first or said second impedance means in series relation with said amplifier means and said torquer means whereby selectively to provide first and second voltages corresponding to said torquer current,

detector means responsive to the output of said amplifier means for selection of said first or said second impedance means,

voltage-to-frequency converter means having a linear conversion range less than said gyro rate range and responsive to the voltage developed across one of said first or said second impedance means for providing an output signal having a corresponding first or second frequency,

counter means responsive to said voltage-to-frequency converter means for counting cycles of said first and second frequency and for producing a count output proportional to the rate sensed by said rate gyroscope,

compensator circuit means responsive to said detector means for rendering said counter means output independent of which of said first or second impedance means is placed in said series relation by said switch means, and

rate tracking circuit means responsive to said amplifier means for further controlling said switch means.

4,179,088

OFFSET BEACON HOMING

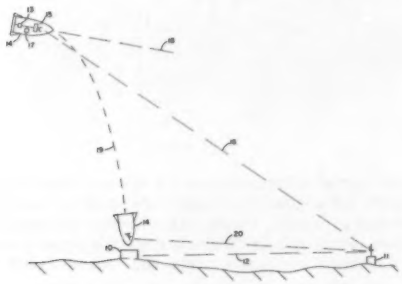
John A. French, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 17, 1976, Ser. No. 742,407
Int. Cl.[2] F41G *7/14, 9/00, 7/00, 11/00*
U.S. Cl. 244—3.19 **2 Claims**

1. A system for enabling homing of a missile onto a target, said target having a radio frequency beacon disposed at a remote predetermined distance and direction therefrom: a missile having computer means thereon for storing signals

indicative of the distance and direction of said target relative to said beacon for storing signals indicative of the inverse of the coordinates of said target; seeker means carried by said missile for acquiring and tracking beacon radiations, said seeker means disposed for emitting signals indicative of spatial coordinates thereof responsive to acquiring and tracking said beacon radiations; said computer means disposed for comparing said signals indicative of said seeker coordinates with said inverse target coordinates and providing signals indicative of the differences in said coordinates; and, means carried on said missile for receiving said signals indicative of the differences in and coordinates for guiding said missile in a direction to reduce to zero the differences between the target coordinates and said inverse coordinates responsive to beacon emissions to home the missile onto the target.

2. A method of homing a missile, having a guidance computer thereon and a seeker responsive to a predetermined



signal frequency, onto a target comprising the steps of: placing a beacon remote from a target; surveying the target area relative to the beacon to determine the geographic coordinates of said target area, said geographic coordinates being defined as azimuth, range and elevation; providing signals to said guidance computer which signals are correlative with said geographic coordinates; surveying said target area to determine the beacon's distance and direction from said target and providing signals to said guidance computer which are correlative with the beacon's distance and direction from said target; establishing control communication between said beacon and said missile whereby said beacon responds to the missile seeker frequency thereby enabling the seeker to locate and track the beacon; and, receiving and comparing signals of the seeker coordinates with the inverse of the signals of the target coordinates stored in the computer memory until the missile is at the target.

4,179,089

APERTURED PANEL CORNER MOUNT FASTENER FOR CONCRETE WALLS

Guy H. Parr, Jr., P.O. Box 16201, Baltimore, Md. 21210

Filed Jul. 5, 1978, Ser. No. 922,139
Int. Cl.[2] F04F *13/00*; A47G *1/16*
U.S. Cl. 248—216.1 **4 Claims**

1. A corner mount fastener for fastening a pegboard or the like at its corner to a hard concrete wall or the like, said fastener comprising:

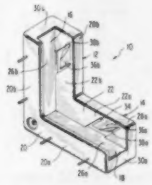
a unitary, hollow member of L-shaped configuration formed of intersecting legs,

each leg including a portion of modified U-shape in transverse cross-section formed by a vertical front wall, a vertical rear wall and transverse outer and inner walls, with the transverse inner wall joining the rear wall to the front wall at a point such that said front wall extends beyond said transverse inner wall to form with the vertical rear wall a slot which intersects with the slot of the other leg of said corner mount fastener,

at least one of said inner front or rear walls is partially cut out to form a flexible finger which projects into said slot,

said slot being of a transverse dimension slightly in excess of the thickness of said apertured panel whereby, said pegboard is frictionally gripped by said fastener when said corner is inserted within said intersecting slot,

and wherein said fastener further comprises vertical mounting pin supporting means extending within both legs and transversely over at least the distance between said front wall and said rear wall and being positioned between the transverse inner and outer walls,



transversely extending holes within said support means and pointed metal pins mounted within said holes and having their head ends projecting outwardly of the front wall.

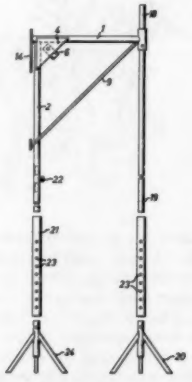
whereby, the corner of said apertured panel may be mounted to the corner mount fastener with respective edges of said apertured panel at its corner within respective slots defined by said intersecting legs and being frictionally held by said flexible fingers, and said pins may be driven through said support means from said front wall towards said rear wall, with the pointed ends embedded some distance within said hard concrete wall.

4,179,090

SCAFFOLDING

Alfred S. Williams, 10 Gloucester Rd., Ealing, London, W5 4BJ, and Raymond Foskett, 20 Grove Park Ter., Chiswick, London, W4, both of England

Filed May 26, 1977, Ser. No. 800,739
Int. Cl.[2] E04G *3/08, 5/04*
U.S. Cl. 248—235 **13 Claims**



1. A scaffolding bracket, for use adjacent a vertical surface and which is constructed to receive a scaffolding support member, comprising:

a horizontal member adapted to support scaffolding boards or the like;

a vertical member connected to said horizontal member and arranged to be located adjacent the vertical surface;

mounting means comprising a flat plate connected to said horizontal member and having apertures therein, spaced apart from said vertical member, for securing the scaffolding bracket to the vertical surface;

coupling means pivotally mounted within the angle formed between said horizontal member and said vertical member and being constructed to receive the scaffolding support member;

a pair of bracing struts extend between the extremities of said horizontal member and said vertical member, opposite and remote from the angle which they form;

said coupling means, which is adapted to receive the scaffolding support member, positioned so the scaffolding support member passes between the pair of bracing struts;

a vertical support member;

clamping means located near the end of said horizontal member remote from the angle formed from the vertical member for clamping said vertical support member;

said vertical support member arranged to project above the level of the horizontal member to form a support for a horizontal guard rail;

said clamping means is of a split tubular construction having two halves which are hinged together; and,

retaining means for retaining the two halves in engagement.

4,179,091

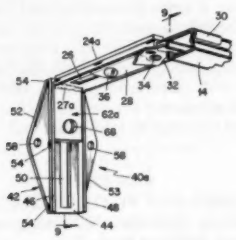
VERTICALLY ADJUSTABLE DRAPERY ROD SUPPORT

Roger Bidney, 3997 N. Victoria St., Saint Paul, Minn. 55112

Filed Jun. 6, 1977, Ser. No. 803,844

Int. Cl.[2] A47H *1/10*

U.S. Cl. 248—265 **5 Claims**



1. A vertically adjustable rod support comprising a mounting plate including a central web and a pair of laterally spaced ribs extending vertically throughout the length of said central web and projecting perpendicularly from the front side thereof, said web having a slot extending vertically throughout substantially the length of said central web between said ribs and parallel thereto, and a pair of flat flange members secured to the rear side of said web, each having a portion projecting laterally therefrom, said flange members being spaced from each other to form a vertical groove therebetween extending the length of said central web and the laterally projecting portion of each flange member having a mounting hole therein, and a rectangular block between said ribs, said block having upper and lower edges and a hole extending therethrough, a screw having a threaded shank extending through both said block hole and said vertical slot, a retention nut in said groove received on said shank, and arm means connected at one end to said block adjacent the upper edge thereof and projecting perpendicularly from said block for engaging a drapery rod at the other or free end thereof, the upper end of said vertical slot and the hole in said block being relatively located with respect to each other so that the upper edge of said block and said arm means can be adjusted to a height corresponding to the upper end of said central web, whereby said screw, when tightened, maintains said block and said arm means at selected vertically adjusted positions including a position in which said arm means is at said corresponding height.

4,179,092

MOUNTING DEVICE FOR DOOR CLOSER

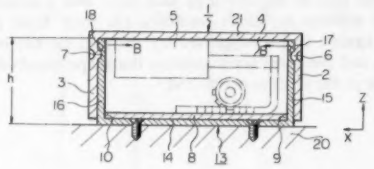
Hiroshi Miyazawa, Hiratsuka, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 9, 1977, Ser. No. 859,107

Claims priority, application Japan, Dec. 20, 1976, 51-170674

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—309 R **5 Claims**



1. A mounting device for a door closer comprising a generally box-shaped main body for containing the door closer mechanism, a mounting plate having a bottom plate and a pair of position control wall portions extending generally perpendicular to said bottom plate from the opposite ends thereof, one wall of said main body having a pair of elongated openings therein at positions along the inner surfaces of said opposite side walls of the main body and being complementary in shape to the cross-sectional shape of said wall portions, said openings having said position control wall portions extending therethrough into said main body with the inner surfaces of said side walls in face-to-face contact with said position control wall portions when the main body is mounted on the mounting plate, and retaining means between the position control wall portions and said opposite side walls for permitting said side walls and said position control wall portions to slide along each other as said position control wall portions are moving into said main body during mounting of said main body on said mounting plate and for retaining said main body from being pulled off said mounting plate.

4,179,093

MOULDING APPARATUS

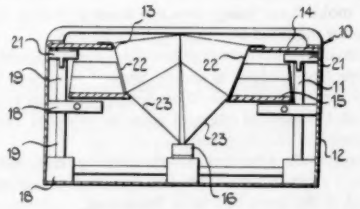
William J. T. Western, 4 Elston Ave., Denistone, New South Wales, Australia (2114)

Filed Sep. 1, 1978, Ser. No. 938,839

Claims priority, application Australia, Sep. 5, 1977, PD1513; Mar. 22, 1978, PD3767

Int. Cl.[2] B28B *7/32, 7/06;* **B29C** *5/00, 1/16*

U.S. Cl. 249—65 **11 Claims**



1. A moulding apparatus for use in the formation of an open-top bowl-like shell whereof at least some of the surface is curved, comprising:

(a) a flexible form layer adapted to be formed into a moulding face for the said shell,

(b) first template means having an edge corresponding in shape to the desired shape of the shell rim bordering said curved surface,

(c) further template means having an edge surface corre-

sponding in shape to a contour of at least a portion of said curved surface of the shell and

(d) containment means to form, together with the flexible form layer, a fluid tight container enclosing the said further template means,

the container being connected to means to vary the fluid pressure within the container so that the fluid pressure on the moulding face of said form layer is different from that on its opposite face to thereby urge said layer into a condition of tensed stiffness in which condition the form layer directly bears against and is supported by the said further template means and the form layer assumes the shape required of the surface of the shell to be formed.

4,179,094

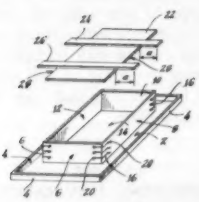
PORTABLE, EXPANDABLE MOLD FOR FABRICATING SUBSTANTIALLY ISOTROPIC ISOCYANATE BASED POLYMER FOAM BUNS

John N. Curtiss, Seabrook; Charles E. Koehler, Baytown, and Pat L. Murray, Dayton, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 709,777, Jul. 29, 1976, Pat. No. 4,104,346. This application May 26, 1978, Ser. No. 910,077

Int. Cl.[2] B29D *27/04*

U.S. Cl. 249—82 **7 Claims**



1. A portable, expandable mold for fabricating isocyanate-based polymer foam buns from the corresponding polymer foam forming mixture and adapted to be readily dismantled for transportation, which mold comprises a box mold having a floor, sidewalls and lid;

said mold floor being in sheet form provided with stop means mounted on the periphery thereof;

at least one oppositely disposed pair of said sidewalls having their lower edges in sliding contact with said floor and having their vertical edges held in abutting relationship with the vertical edges of adjacent sidewall members by extensible coupling means;

said sidewalls, when held in said abutting relationship, defining a cross-sectional area less than that of said mold floor and of the foam bun to be fabricated;

said lid having side projecting members adapted to provide sliding contact with the upper edges of said sidewalls during lateral movement of the latter;

said lid being free to rise vertically and out of contact with the upper edges of said sidewalls under pressure from expanding foam mix; and

said extensible coupling means being yieldable under pressure from expanding foam mix to permit such of said sidewalls as are free to do so to move outwardly and to engage said stop means on theperiphery of said mold floor.

4,179,095

PNEUMATICALLY OPERATED AIR LOCK FOR AIR DUCTS, PARTICULARLY FOR AIR CONDITIONING PLANTS

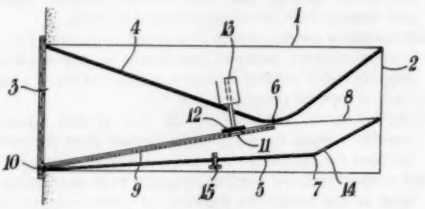
Luciano Tesolin, Via Conserva, Villanova (Pescara), Italy

Filed Mar. 9, 1978, Ser. No. 885,047

Claims priority, application Italy, Mar. 10, 1977, 48422 A/77

Int. Cl.[2] F16K *31/385*

U.S. Cl. 251—30 **3 Claims**



1. A pneumatically operated air lock comprising a casing having an inlet end, adapted to be connected to an air conveying duct, and an outlet end; a choke duct within said casing and having an outlet area coincident with said casing outlet end; a membrane positioned within said choke duct and consisting of a layer of flexible material having first and second cross sides fastened respectively to corresponding sides of one wall of said choke duct, said layer of flexible material having a breather hole therethrough; an electromagnet; a disk responsive to said electromagnet and capable of assuming a first position in which the breather hole is open permitting said membrane to be substantially adherent to said one wall of said choke duct, allowing the passage of air from said inlet end to said outlet end, and a second position in which the breather hole is blocked by said disk, causing inflation of said membrane and extension of said membrane across said choke duct to prevent airflow from said inlet end to said outlet end.

4,179,096

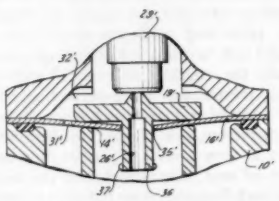
VALVE MEMBER FOR PILOT OPERATED VALVES

James P. Fromfield, Belleville, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed Apr. 3, 1978, Ser. No. 892,621

Int. Cl.[2] F16K *31/10*

U.S. Cl. 251—38 **4 Claims**



1. In a pilot operated valve having a valve body formed with an inlet port, an outlet port, an orifice between the ports, and a valve seat surrounding the orifice,

a valve member cooperable with the valve seat to close and open the valve, said valve member comprising:

a flexible diaphragm within the valve body movable into direct engagement with the valve seat to close the valve and out of engagement with the valve seat to open the valve, said diaphragm having a hole in its region surrounded by the valve seat when the valve is closed,

a rigid support plate resting against the face of said diaphragm opposite the face which engages the valve seat, said support plate having a diameter at least as large as the

diameter of the valve seat so that said rigid support plate presses said diaphragm against the valve seat when the valve is closed,

a stem projecting from said plate through the hole in said diaphragm, and

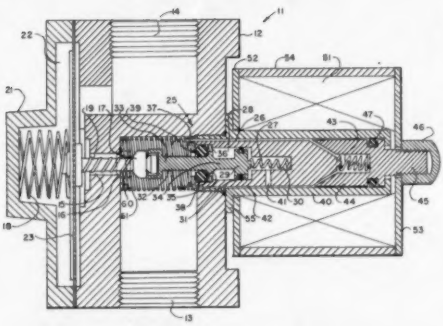
said valve member being devoid of means for rigidly securing said diaphragm and plate together so that the portion of said diaphragm within the orifice surrounded by the valve seat is free to flex away from the lower surface of said support plate.

4,179,097

SAFETY SHUT-OFF VALVE

Frank Fiedler, Jr., 2429 Agostino Dr., Rowland Heights, Calif. 91748

Filed May 31, 1978, Ser. No. 911,273
Int. Cl.[2] F16K *31/02*
U.S. Cl. 251—130 **9 Claims**



1. A pressure responsive shut-off valve comprising:

a valve housing means defining a fluid inlet and a fluid outlet and a valve seat therebetween;

a valve closure means movable between a closed position against said valve seat and an open position away therefrom, said closure means preventing fluid flow between said inlet and outlet when in said closed position and permitting said fluid flow when in said open position;

a valve operator means comprising a pressure responsive piston movable between set and release positions, said operator means coupled to said valve closure means so as to effect location thereof in said open position with said piston in said set position and location thereof in said closed position with said piston in said release position;

a cylinder body means retaining said piston, said cylinder body means defining an activating volume communicating with said inlet and establishing an activating fluid pressure forcing said piston toward said release position, said cylinder body means further defining a reference volume communicating with said inlet and establishing a reference volume on the opposite face of said piston;

a seal means for sealing said inlet from said reference volume with said piston in said set position and providing fluid communication therebetween with said piston in said release position;

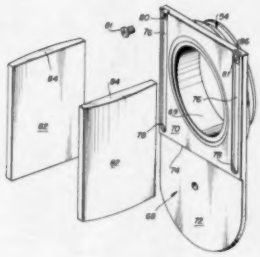
latching means for latching said piston in said set position; and manual reset means for moving said piston from said release position to said set position.

4,179,098

SPACER PLATES FOR GATE VALVE SEAT ASSEMBLIES

Anthony A. Laitkep, Wharton; Danny S. Meyer, Richmond, and Hamid J. Saka, Houston, all of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,907
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—167 **4 Claims**



1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, an annular recess in the valve body surrounding each flow passage and opening into the valve chamber;

an expanding gate valve assembly including a gate element and segment slidably mounted within the valve chamber for movement between open and closed positions with said gate element and segment expanding away from each other at the fully open and closed position, said gate element and segment having ports therethrough alignable with said flow passages in the open position of the valve assembly;

a seat assembly fitting within each recess for floating back and forth movement each seat assembly having a flow passage and a skirt about the flow passage movable with the seat assembly, thereby forming a pair of skirts in opposed facing relation with the gate assembly positioned between the skirts, each skirt having a planar sealing face in facing relation to and in contact with the gate assembly, said skirts each having a pair of generally parallel grooves outwardly of the gate assembly extending in a direction generally parallel to the longitudinal axis of the gate assembly; and

a pair of spacer plates alongside the gate assembly and between the skirts fitting in grooves in opposed skirts and extending in a direction generally parallel to the longitudinal axis of the flow passages and maintaining a minimum clearance between the seat assemblies and gate assembly.

4,179,099

EXPANDING GATE VALVE

Elwood K. Pierce, Jr., Coldspring, Tex., assignor to Petroleum Designers, Inc., Houston, Tex.

Filed Jul. 3, 1978, Ser. No. 921,460
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—168 **16 Claims**

1. A gate valve for controlling the flow of fluid, said gate valve comprising:

valve body means being formed to define a valve chamber and inlet and outlet flow passages intersecting said valve chamber;

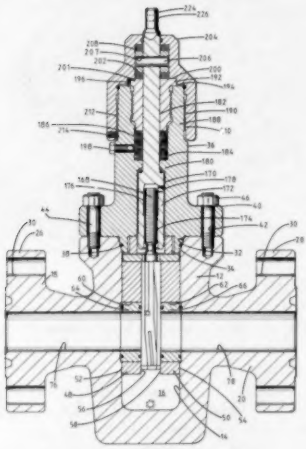
a pair of valve seats located in opposed relation within said valve chamber and in surrounding relation with respective ones of said flow passages;

a pair of gate segments being movably positioned within said valve chamber and being interposed between said valve seats, each of said gate segments defining sealing surface means in sealing engagement with respective ones of said valve seats, said gate segments defining port means for

registry with said flow passages in the open position of said valve and defining blocking means for blocking the flow of fluid through said flow passages in the closed position of said valve;

bonnet means being secured to said valve body and forming a closure for said valve chamber;

actuator means being provided on said bonnet means and being connectable to said gate segments for causing reciprocation of said segments within said valve chamber; and



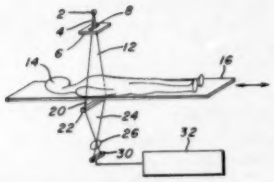
spreader means being positioned within said valve and engaging said gate segments, said spreader means allowing collapsing of said gate segments to facilitate segment travel between the open and closed positions of said valve and causing expansion of said segments in the open and closed positions of said valve to mechanically enhance the sealing ability of said gate valve.

4,179,100

RADIOGRAPHY APPARATUS

Donald Sashin, and Ernest J. Sternglass, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Aug. 1, 1977, Ser. No. 820,424
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—416 TV **36 Claims**



1. Radiography apparatus comprising

a source of radiation,

collimator means interposed between said radiation source and an object to be exposed to radiation for converting said radiation into a generally fan-shaped beam,

scintillator means disposed on the opposite side of said object from said radiation source for converting radiation into light,

a self-scanning integrated array of photodiodes for receiving light produced by said radiation and emitting responsive electrical signals,

optical coupling means connecting said scintillator means to said self-scanning photodiode array,

said optical coupling means having fiber optic means operatively associated with said scintillator means and said self-scanning array of photodiodes, whereby light emitted by said scintillator means will be delivered with substantial continuity to said self-scanning array of photodiodes,

signal receiving means operatively associated with said self-scanning photodiode array to store, process or display said image information,

said self-scanning array of photodiodes being a planar array having at least two parallel rows of linear self-scanning photodiode arrays, and

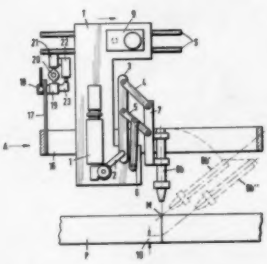
said self-scanning array of photodiodes having two said rows of linear self-scanning photodiode arrays, disposed with said linear arrays of a first said row being staggered with respect to said linear arrays of a second said row.

4,179,101

TWO TORCH HEAD FOR OXYGEN CUTTING MACHINES

Hans Bräutigam, Klein-Krotzenburg, Fed. Rep. of Germany, assignor to Esab-Kebe GmbH, Karben, Fed. Rep. of Germany

Filed Jan. 9, 1978, Ser. No. 868,144
Int. Cl.[2] B23K *7/10*
U.S. Cl. 266—77 **11 Claims**

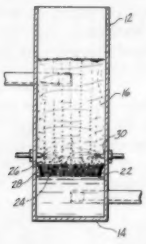


1. A torch head for an oxygen-cutting torch machine comprising, in combination, a torch head; a first torch mounted on the torch head for cutting perpendicular cuts; a second torch mounted on the torch head for cutting at an angle to the perpendicular; the mounting for the second torch having two parallel side shaft members and two parallel cross shaft members, each pivotably attached to the other at spaced locations so as to define a parallelogram swinging means in which the four members move pivotably and in parallel together; the second torch being mounted to one of the side shaft members so that the second torch can be positioned according to the cutting requirement at any preselected angle to the perpendicular according to the relative movement of the parallelogram members; a drive means mounted on the torch head for swinging the parallelogram swinging means; a shaft member rotatable about a point fixed to the torch head and having two spaced pivot mountings, one on each side of the fixed point, one pivot mounting being pivotably attached to the other of the side shaft members, and the other pivot mounting being pivotably attached to the drive means, a supporting shaft member having two spaced pivot mountings, one pivot mounting being pivotably attached to the torch head, and the other pivot mounting being pivotably attached to one of the cross shaft members at about the midway point between the two shaft members, thereby supporting the parallelogram swinging means against collapse; so that operation of the drive means rotates the rotatable shaft member and thereby swings the parallelogram swinging means and the second torch means through a selected arc, and thus moves the second torch means into a selected angular cutting position.

4,179,102
APPARATUS FOR THE DEGASSING AND FILTRATION OF MOLTEN METAL

Joseph A. Clumpner, Creve Coeur, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,511
Int. Cl.² C22B 9/02
U.S. Cl. 266—218 **15 Claims**

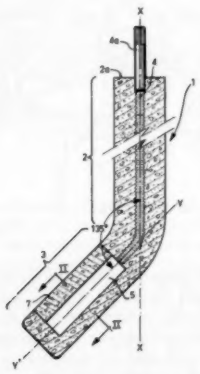


1. An improved apparatus for use in the degassing of molten metal which comprises:
chamber means having an elongated side wall portion;
inlet means at a first height for introducing said molten metal into said chamber;
outlet means at a second height below said first height for removing said molten metal from said chamber;
fluxing gas inlet means at a third height below said first height for introducing said fluxing gas into said chamber wherein said molten metal inlet means is located with respect to said side wall portion for tangentially introducing said molten metal into said chamber in either a clockwise or counterclockwise flow direction such that said molten metal swirlingly flows in a clockwise or counterclockwise manner from said metal inlet towards said metal outlet as said fluxing gas percolates up through said molten metal.

4,179,103
MEANS FOR INJECTING GAS INTO A MOLTEN METAL

Gérard Bentz, Elancourt-Trappes, and Bernard Racouchot, Franconville, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Jan. 30, 1978, Ser. No. 873,618
Claims priority, application France, Feb. 10, 1977, 77 03701
Int. Cl.² C22B 21/06; C21C 7/00
U.S. Cl. 266—225 **11 Claims**

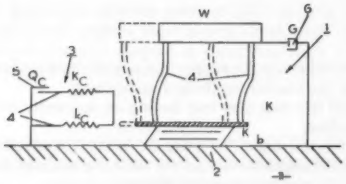


1. A delivery device for injecting a gas into a mass of molten metal, the device comprising, in combination:
an elongate member of impermeable refractory material, the elongate member including a straight body portion and a straight head portion having an angled connection with the body portion, the head portion including a closed end, a side wall disposed between the closed end and the body portion, and a recess extending inwardly into the head portion from said side wall;
a porous refractory element located in the recess; and
a gas inlet conduit positioned within the elongate member, the inner end of the conduit being in open communication with the recess.

4,179,104
MECHANICAL ATTENUATOR

Robert I. Skinner, and Arnold J. Heine, both of Wellington, New Zealand, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

Continuation-in-part of Ser. No. 575,747, May 8, 1975, abandoned. This application Jan. 4, 1977, Ser. No. 756,607
Int. Cl.² F16F 1/16
U.S. Cl. 267—154 **13 Claims**

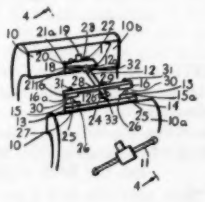


1. In a structure such as a building, a bridge or a nuclear reactor said structure resting on a base, the improvement comprising at least one support interposed between a first portion of said structure and said base, said support carrying at least a part of the weight of the structure and having flexibility in a horizontal direction of motion of at least a major portion of the structure and at least one hysteretic energy absorber connected between a further portion of said structure and a further portion of said base for absorbing horizontal accelerating forces originating from earthquakes and consequential motions, said hysteretic energy absorber being substantially unaffected by normal ambient accelerating forces.

4,179,105
MAGNETIC PRESS FOR VISES

Lester S. Krulwich, 241 Central Park West, New York, N.Y. 10024

Filed Aug. 22, 1978, Ser. No. 935,969
Int. Cl.² B25B 11/00
U.S. Cl. 269—8 **1 Claim**



1. A magnetic press for vises provided with two parallel flat faced jaws and a handle comprising magnets fastened on a flat plate removably attached to a jaw of the vise, said magnets having their magnetic poles the same as those on the opposite faces of magnets attached to a projection aligned movably and

right angularly to said plate, thereby repelling said magnets with said projection towards the jaw opposite said flat plate with increasing compression as the jaws are drawn towards each other by the vise handle.

4,179,106

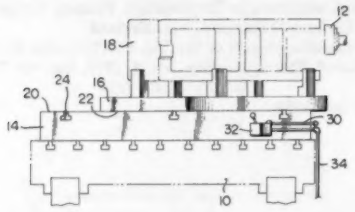
APPARATUS FOR LOCATING AND CLAMPING A WORK MEMBER SUPPORTING FIXTURE

Raymond A. Bergman, 107 E. Second St., Minster, Ohio 45865

Continuation of Ser. No. 815,676, Jul. 14, 1977, abandoned, which is a division of Ser. No. 684,725, May 10, 1976, Pat. No. 4,058,885. This application Jul. 17, 1978, Ser. No. 924,958

Int. Cl.[2] B23Q *7/00*

U.S. Cl. 269—20 **26 Claims**



1. An apparatus for supporting a work member in a machine tool for the machining thereof comprising:

a table in a machine tool having an upwardly facing upper surface,

a fixture having a downwardly facing lower surface resting on the upper surface of the table and adapted for having a work member mounted thereon,

means for supplying fluid under pressure between said surfaces for floatingly supporting the fixture on the table to permit free movement of the fixture thereon,

locating means for selectively positively locking said fixture on said table in at least two different predetermined positions against any horizontal movement thereon and for permitting translational movement of the fixture on the table and mechanically confining the movement of said fixture on said table when it is translated from one of said predetermined positions to the other,

said locating means comprising a pair of spaced apart locating pin means extending from one of said surfaces and at least three openings in the other of said surfaces, said pair of pin means being engageable respectively with a pair of said openings when said fixture is in one of said predetermined positions, one of said pin means being engageable with one of said openings during the movement of said fixture between one of said predetermined positions to the other of said predetermined positions, and said pair of pin means being engageable with a pair of said openings when said fixture is in the other of said positions,

at least one of said pin means being selectively retractable, and

clamp means on the table for clamping the fixture thereto.

4,179,107

PRINTING AND COLLATING METHOD

Jerome R. Harris, Charlottesville, Va., assignor to Amprint Corp., Gordinsville, Va.

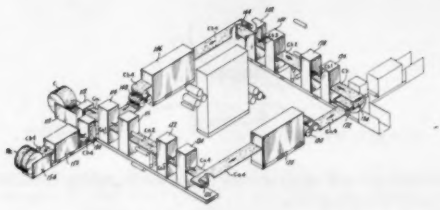
Continuation of Ser. No. 623,748, Oct. 20, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 789,339

Int. Cl.[2] B41F *13/58*

U.S. Cl. 270—4 **11 Claims**

1. A method for collating printed material on a web having printed longitudinal inner and outer web sections wound as a web roll on a common core with each of said web sections having a series of aligning holes along an edge thereof comprising the steps of loading a plurality of said roll wound webs in said collator in proper relative orientation with respect to said preprinting, unwinding each of said roll wound webs by utilizing said series of aligning holes, separating said web sections, then moving said separated inner and outer web sections into superposed relationship with one another, moving said plurality of webs into superposed collated orientation utilizing said series of aligning holes forming a superposed stack of collated web sections.

2. A method of concurrently printing side-by-side groups of pages on an elongated web having first and second surfaces for subsequent collation and final finishing comprising printing first and second groups of pages on corresponding first and second longitudinally extending side-by-side web sections on the first surface of said elongated web in at least a first color,



perforating said elongated web along its length with corresponding first and second series of aligning holes along edges of said corresponding first and second web sections with said aligning holes being oriented in relation to each other and to the respective groups of printed pages in registration with said first and second groups of pages, slitting said elongated web to separate said first and second web sections for subsequent collation and final finishing, rewinding said separated first and second web sections on a common core for subsequent collation and final finishing utilizing said first and second series of aligning holes for moving said separated first and second web sections into superposed relationship to one another.

4,179,108

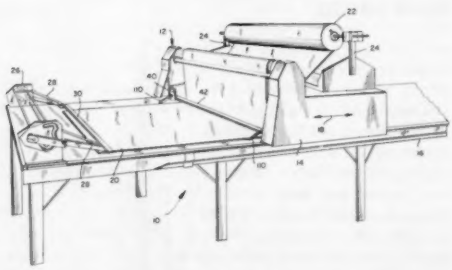
SUPPLEMENTAL FEED ASSEMBLY FOR SHEET MATERIAL SPREADING MACHINE

Harold Grimm, Bronx, and Ira Zuckerman, Rosedale, both of N.Y., assignors to Panther Machine Corp., New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,292

Int. Cl.[2] B65H *29/45*

U.S. Cl. 270—31 **7 Claims**



1. In a fabric spreading machine for spreading sheet material in superimposed layers on a table surface, and including a carriage which moves back and forth over said table surface in opposed operative strokes between a pair of spaced fold-retaining members, with said carriage having a fold-forming assembly, a shaft, and a positive feed roller mounted on said shaft for rotation therewith, for feeding a supply of sheet material carried by said carriage onto said table, and first drive means connected to said positive feed roller for continuously rotating the latter during said operative strokes with said sheet material

fed at a rate corresponding to the speed of travel of said carriage;

a supplemental feed assembly comprising second, intermittent drive means connected to said shaft through a one-way clutch mounted on said shaft and operatively connected to said positive feed roller for intermittent additional rotation thereof to provide an overfeed of said sheet material as said carriage approaches and engages each of said fold-retaining members,

actuating means mounted on said carriage and operatively connected to said intermittent drive means for actuating the latter in response to arrival of the carriage at that portion of each of said operative strokes in which the fold-forming assembly moves into contact with a respective fold-retaining member,

and lost motion means mounted on said shaft for operatively connecting said first drive means to said positive feed roller and operable by said second, intermittent drive means, after the latter has turned said roller through said additional rotation to provide said overfeed of material, for disconnecting said feed roller from said first drive means for a selected period sufficient to take up slack of excess sheet material fed as said carriage commences movement in the opposite stroke,

said lost motion means comprising a first coupling block rigidly mounted on said shaft, a second coupling block rotatably mounted on said shaft and spaced apart from said first coupling block, a first drive pin connected to said first coupling block and projecting toward said second coupling block, and a second drive pin connected to said second coupling block and projecting toward said first coupling block, said second drive pin being positioned to engage said first drive pin to form a driving connection therewith, said first drive means being connected to said second coupling block for rotating the latter.

4,179,109

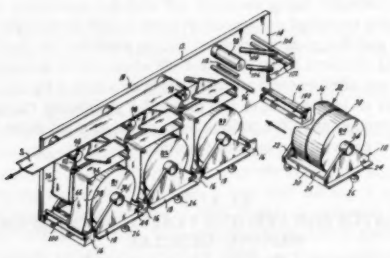
COLLATING EQUIPMENT INCLUDING COLLATOR AND CART

Jerome R. Harris, Charlottsville, Va., assignor to Amprint Corp., Gordonsville, Va.

Continuation of Ser. No. 789,341, Apr. 20, 1977, abandoned, which is a continuation of Ser. No. 623,749, Oct. 20, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 868,038

Int. Cl.[2] B65H *39/00*

U.S. Cl. 270—52 **17 Claims**



1. An apparatus for collating printed material on a web roll with individual inner and outer web sections printed thereon which web sections are on a common core each of said sections having a series of aligning holes thereon along one edge of each of said web sections comprising a frame, at least one station of said frame adapted to receive said web roll, web drive means mounted on said frame and adapted to be engaged with said web roll when the latter is loaded into said station, a powered master roller mounted on said frame and positioned at said station, first means positioned at said station for directing said inner web section of said web over said master roller, second means positioned at said station for directing said outer web section of said web roll into collated and superposed relation to said inner web section on said master roller, and means associated with said master roller for maintaining said superposed relationship between said inner and outer web sections and for directing said superposed inner and outer web sections away from said station whereby the pre-printed inner and outer web sections emerge from said station in collated and superposed relation.

17. A collator for assembling printed material from a plurality of web rolls each containing two individual side-by-side web sections wound on a common core with each web section having a series of aligning holes along one edge thereof comprising a support, a plurality of work stations along said support and each being adapted to receive one of said web rolls, drive means mounted on said support at each work station and adapted to engage with the corresponding web roll, a plurality of powered master rollers each of said master rollers mounted on said support at each work station, a plurality of first positioning means mounted at each work station adjacent a first web section adapted to direct said first web section over one of said master rollers, a plurality of second positioning means mounted at each work station adjacent a second web section adapted to direct said second web section over another of said master rollers at an adjacent work station, means for superposing said second web section with said first web section, and a plurality of extensible aligning pins on each of said master rollers engaging said aligning holes in each of said web sections at each work station and adapted to direct said web sections along said support to an adjacent work station.

4,179,110

METHOD FOR OPPOSING A SHEET-LIKE MATERIAL TO A STANDARD PLANE WITH PREDETERMINED SPACE THEREBETWEEN

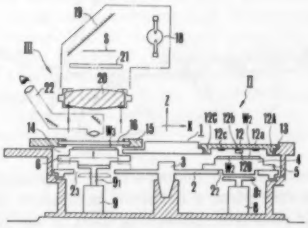
Masao Kosugi, and Hideki Yoshinari, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 679,825, Apr. 23, 1976, abandoned, which is a continuation of Ser. No. 580,704, May 27, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 769,900

Claims priority, application Japan, May 28, 1974, 49-59922; May 28, 1974, 49-59923

Int. Cl.[2] B65H *39/00*

U.S. Cl. 270—58 **2 Claims**



1. An apparatus for precisely opposing a semi-conductor wafer with a mask and having a parallel and perdetermined space therebetween without contact of said wafer and mask, comprising:

a mask carrier, for holding a mask having a surface, said mask carrier to be opposed with a mask;

a wafer carrier, for holding a semiconductor wafer having a front surface, said front surface to be opposed with said surface of the mask;

a first calibrator having a first reference plane which has a predetermined relationship with said mask surface and being in contact with the front surface of the wafer;

first movable means for mounting said wafer carrier and for movement between a retracted position at which the wafer carrier may be loaded onto and unloaded from the first movable means and an extended position at which the

front surface of the wafer may be in contact with the first reference plane;

second movable means for mounting said wafer carrier and for movement between a retracted position and an extended position;

turn table for transferring said wafer carrier from said first movable means to said second movable means when in said retracted positions respectively;

equalizer means for tilting the wafer held by said carrier and for obtaining a parallel condition of the front surface of the wafer with respect to the first reference plane of the first calibrator when said wafer contacted with the first calibrator and the back surface and front surface of the wafer is not parallel;

spacing means mounted on said wafer carrier for providing an amount of tilt of the wafer with respect to the reference plane of the first calibrator; and

a second calibrator having a second reference plane which has a predetermined relationship with said surface of the mask and being contacted with the spacing means when said second movable means is positioned at the extended position.

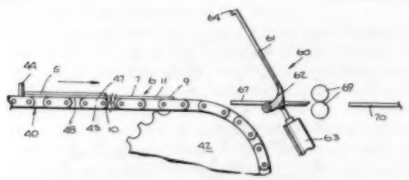
4,179,111
FOLDING MECHANISM

William H. Gunther, Jr., Mystic; Roman M. Golicz, Clinton, and James W. Hough, Madison, all of Conn., assignors to G. B. R., Ltd., Dover, Del.

Continuation-in-part of Ser. No. 680,788, Apr. 27, 1976, Pat. No. 4,071,997. This application Nov. 21, 1977, Ser. No. 853,134

Int. Cl.[2] **B65H** *45/14*

U.S. Cl. 270—68 R **2 Claims**



1. A mechanism for folding a sheet comprising a conveyor, a ramp, a feed plate, a deflecting mechanism and a pulling roller, said conveyor terminating short of said pulling roller, said ramp, feed plate and deflecting mechanism being interposed between said conveyor and said pulling roller, said conveyor moving said sheet on a horizontal plane, said ramp extending upwardly away from said plane, said ramp being at an angle to said plane which is no greater than 90° to the direction from which the sheets are advancing, said ramp having a forward end and a rear end and having a stop at its forward end, said feed plate being located below said ramp to support said moving sheets in a horizontal plane, the rear end of said ramp being spaced above said feed plate to form a gap between said plane and rear end, said deflecting mechanism movable relative to said feed plate from a gap-closing position below said plane and out of the path of the sheet to open the gap to permit the folded sheet to pass through the gap along said feed plate and said pulling roller mounted to grasp the folded sheet after it moves through the gap and past said feed plate.

4,179,112
APPARATUS FOR CONVEYING SHEETLIKE ORIGINAL MATERIAL TO BE COPIED

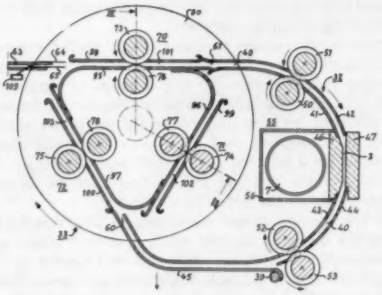
Theo P. C. Breuers, Venlo, and Joannes J. W. M. Joosten, Baarlo, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Filed Nov. 10, 1977, Ser. No. 850,291

Claims priority, application Netherlands, Nov. 16, 1976, 7612693

Int. Cl.[2] **B65H** *9/10, 5/18, 9/08*

U.S. Cl. 271—3 **13 Claims**



1. In an apparatus for conveying a sheetlike original to be copied past the exposure window of a copying machine, which apparatus includes a feed section, an exposure section provided with the exposure window, with an entry, with an exit and with conveying and guiding elements, an ejection section and return means, to be selectively engaged, for returning an original from the exit to the entry of the exposure section, the improvement wherein the return means comprises at least two sets of gripping and conveying elements mounted in a common supporting element which can be displaced cyclically to a number of positions, in each position of the supporting element and with the return means being engaged, one set occupying a first location situated in a path of movement of an original sheet leaving the exposure section, and the other set occupying a second location situated in a path of movement joining the entry to the exposure section, switching means for switching the gripping and conveying elements of each set on and off, the gripping elements being switched off and the conveying elements being switched on as soon as a set arrives in the second location, and the gripping elements being switched on and the conveying elements being switched off when a set is in the first location and after an original sheet has been gripped by this set by at least its leading edge, and means for displacing the supporting element after the trailing edge of an original sheet has passed the entry of the exposure section.

4,179,113
APPARATUS FOR FEEDING LEAFLETS TO RAPIDLY MOVING ARTICLES

Claris C. Gallimore, Lake Villa, Ill., assignor to F. D. Graphics, Inc., Lake Villa, Ill.

Filed Jan. 9, 1978, Ser. No. 867,714

Int. Cl.[2] **B65H** *5/08*

U.S. Cl. 271—12 **15 Claims**

1. Apparatus for feeding leaflets to articles moving past said apparatus, comprising in combination

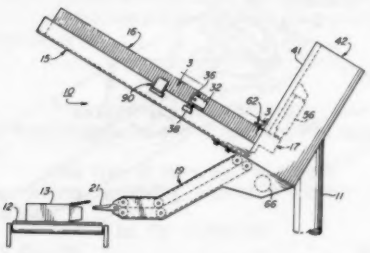
an inclined tray for holding a plurality of said leaflets in face-to-face relationship for movement toward one end of said tray,

reciprocating means mounted at said one end of said tray for reciprocal movement in a direction transverse to the direction of movement of said leaflets in said tray,

transport means mounted at one end of the path of said reciprocal movement of said feed means for propelling

leaflets supplied thereto to said articles as they move past the discharge end of said transport means,

feed means carried by said reciprocating means for removing said leaflets one by one from said one end of said tray and feeding them seriatem to said transport means,



a plurality of elongated arms extending into the path of movement of said leaflets in said tray, and

support means mounting said arms at respectively adjustable angles relative to said path of movement.

4,179,114

FILM SHEET HANDLING DEVICE

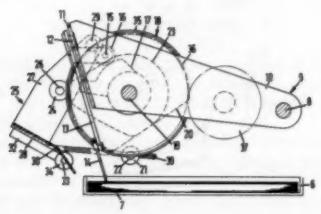
Lucas van der Does, Oenkerk, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Dec. 15, 1977, Ser. No. 860,747

Claims priority, application Netherlands, Dec. 20, 1976, 7614149

Int. Cl.[2] B65H *3/22*

U.S. Cl. 271—19 **6 Claims**



1. A device for removing a film sheet from a stack of such film sheets present in a cassette, said device comprising:

a frame;

means on said frame for holding said cassette containing said stack of said film sheets;

a pivoting member pivotally mounted to said frame, said pivoting member comprised of at least one arm pivoting about an axis extending transversely to the direction of transport of said film sheets, said arm having a portion bent-over substantially at right angles to said arm;

a bell crank lever pivotally mounted to said bent portion of said arm of said pivoting member;

a pin fixedly carried by said bell crank lever;

first camming means for controlling the movement of said pivoting member and operable to pivot said pivoting member and the lever attached to the latter, so that said pin is moved into engagement with the uppermost film sheet of said stack in a marginal area thereof;

second camming means for controlling the movement of said bell crank lever, and operable to pivot said bell crank lever so that said pin, whilst in engagement with the uppermost film sheet of said stack, is moved in a direction substantially parallel to the plane of said sheet, thereby causing said sheet to become bulged;

a film sheet guiding member connected to said frame;

means for moving said film sheet guiding member under the uppermost film sheet of said stack when said film sheet is at least partially separated from said stack; and

means for further removal of said film sheet via said film sheet guiding member.

4,179,115

SHEET FEEDING AND COLLATING APPARATUS

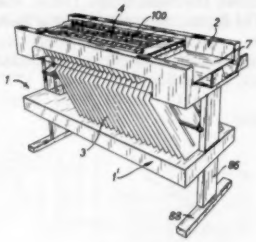
Kurt Ruenzi, Kuesnachterstrasse 59, Zumikon, Switzerland (8126)

Continuation-in-part of Ser. No. 674,917, Apr. 8, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,899

Claims priority, application Switzerland, Apr. 15, 1975, 4759/75

Int. Cl.[2] B65H *29/60, 31/24*

U.S. Cl. 271—297 **20 Claims**



1. A sheet collating apparatus comprising frame means including a bottom portion and a top portion separable from said bottom portion, a plurality of collating compartments arranged in a row and having substantially upwardly facing openings, sheet advance means also supported by said frame means above said openings, sheet deflecting gate means each of which is arranged for cooperation with its respective collating compartment for deflecting a sheet into said respective collating compartment, actuating means connected to the sheet deflecting gate means, and control means operatively connected to said actuating means for sequentially positioning said sheet deflecting gate means into the path of an advancing sheet to sequentially place a sheet in each collating compartment, said control means comprising an electromagnet for each sheet deflecting gate means and circuit means including light switch means and electromagnets arranged to be sequentially activated by one sheet after another for sequentially tilting each sheet deflecting gate means into a sheet deflecting position, said sheet advance means comprising driven rollers (**8**, **11**), drive shaft means (**25**) rotatably supporting said driven rollers in said frame means, positive drive means (**12**) operatively connected to said drive shaft means (**25**) of said driven rollers for positively rotating said driven rollers, said sheet deflecting gate means comprising tilting shafts (**24**) and gates (**10**) secured to said tilting shafts which are tiltably supported in said frame means intermediate adjacent drive shafts (**25**), said gates (**10**) being spaced from each other in the feed advance direction of the sheets so that gaps extend across the feed advance direction, said driven rollers extending in said gaps between adjacent sheet deflecting gates (**10**), said sheet deflecting gates (**10**) having a sheet passing position below a plane defined by said driven rollers (**8**, **11**) whereby each gate substantially closes its respective collating compartment, and a sheet deflecting position, whereby the gate reaches with its free end above the plane defined by said driven rollers (**8**, **11**) thereby opening the respective collating compartment, and further comprising cover means hinged to said frame means and positioned above said driven rollers (**8**, **11**), said cover means comprising sheet hold down means extending in the feed advance direction of said sheets, said sheet hold down means comprising a plurality of rotatable hold down ball elements, means operatively securing said hold down ball elements to said hinged cover means in such positions that the hold down ball elements protrude downwardly

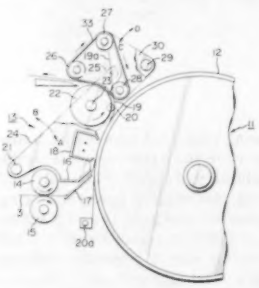
through said gaps between said gates (**10**), said securing means including means for preventing said ball elements from falling downwardly out of said securing means when the securing means are tilted with said hinged cover means and wherein said collating compartments are arranged in said bottom portion of said frame means, said sheet deflecting gate means being arranged in said separable top portion of said frame means.

4,179,116

SEPARATING MECHANISM

Kazumi Umezawa, Kawasaki; Hiroyuki Hattori, Inagi; Hiroshi Ogawa, Kawasaki; Hirotoshi Kishi, Tokyo, and Seiji Sagara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 919,148
Claims priority, application Japan, Jul. 8, 1977, 52/81569
Int. Cl.[2] B65H *29/54*
U.S. Cl. 271—306 **9 Claims**



1. A separating mechanism having a separation guide disposed between an image bearing member and a side edge of transfer medium to direct the transfer medium away from the image bearing member, said separation guide being disposed adjacent to or in contact with said image bearing member with one end thereof as a supported end and the other end as a free end, a first bearing member adapted to bear against the free end of said separation guide from the non-image bearing member side and a second bearing member adapted to bear against the free end of said separation guide from the image bearing member side, said free end of said separation guide being supported by said first and second bearing members.

4,179,117

PAPER ALIGNMENT ROLLERS

John H. Rhodes, Jr., Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

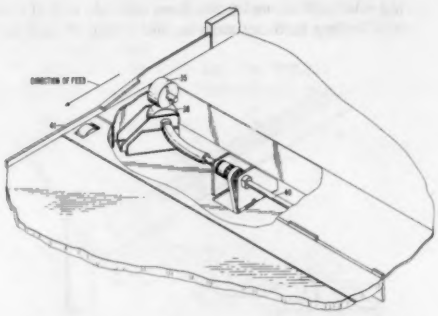
Filed Dec. 30, 1977, Ser. No. 865,803
Int. Cl.[2] B65H *9/16*
U.S. Cl. 271—251 **2 Claims**

1. In a system for aligning a sheet of fragile material against a reference edge parallel to the direction of sheet travel;

first roll means skewed to the direction of travel for moving said sheet toward said reference edge;

mating roll means skewed oppositely to said first roll means for urging said sheet away from said reference edge; and

said first roll means having a higher coefficient of friction than said mating roll means so that said sheet is moved toward said reference edge;



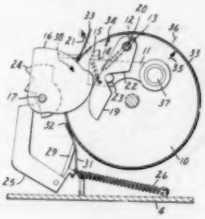
whereby the force tending to crumple said sheet at the reference edge is minimized while the drive force in the direction of sheet travel remains high.

4,179,118

APPARATUS AND METHOD FOR RELEASABLY SECURING SHEET MATERIAL TO THE DRUM OF A DRUM-TYPE FACSIMILE MACHINE

Charles P. Huss, Oak Park Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 8, 1977, Ser. No. 831,361
Int. Cl.[2] B65H *5/2*
U.S. Cl. 271—277 **7 Claims**



1. In a facsimile machine having a rotatable drum and apparatus for loading sheet material onto the drum and unloading the sheet material from the drum comprising:

a clamping means carried by the drum and movable between a clamped position at which the sheet material is held at an edge portion to the drum by the clamping means and an unclamped position at which the clamping means is spaced from the drum;

means for engaging said clamping means for moving said clamping means from said clamped position to said unclamped position and imparting limited rotation to the drum when so moving said clamping means;

gripping means movable between a position spaced from the drum and a position in contact with the sheet material carried on the drum for inhibiting movement of the sheet material in response to movement of the drum;

means for engaging said gripping means for moving said gripping means into contact with the sheet material; and

means for providing time coordinated operation of said last-mentioned and said means for engaging said clamping means to move said gripping means into contact with the sheet material before said limited rotation is imparted to the drum during the time said clamping means is moved to an unclamped position causing said limited rotation imparted to the drum to displace said edge portion of said sheet material relative to said clamping means allowing

the inherent resiliency of said sheet material to move said edge portion away from the drum and said clamping means, said time coordinated operation then positioning said means for engaging said gripping means to place said gripping means at a position spaced from the drum whereby said sheet material can be grasped at said edge portion for manual unloading of said sheet material from the drum while said gripping means is at a position spaced from the drum.

4,179,119

SKIPPING ROPE OR WIRE

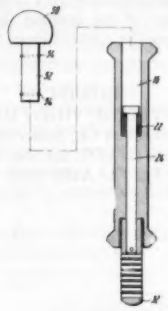
Gerard Wolf, Oliggasse 46, D-6733 HaBlock, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 890,985

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716107

Int. Cl.[2] A63B *5/20*

U.S. Cl. 272—75 **14 Claims**



1. A skipping rope with handles attached at the ends, each said handle having a longitudinal axis and comprising:

a peg rotatably supported within each handle, said peg protruding axially from said handle; and

a rope-accommodating part fastened to the free end of said peg and extending along the handle axis, said part having a plurality of means spaced along said axis whereby a rope end may be selectively connected to one of said means to hold the rope in an adjusted position relative to said handle.

4,179,120

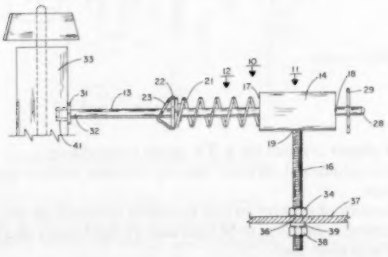
BOWLING BALL KICKER PRESSURE DEVICE

Fred Hendricks, 3008 S. 134th St., Omaha, Nebr. 68144, and Cassius W. Draper, 810 5th St., Fairbury, Nebr. 68352

Filed Jul. 11, 1977, Ser. No. 814,530

Int. Cl.[2] A63D *5/02*

U.S. Cl. 273—49 **9 Claims**



1. In an automatic bowling pin spotter apparatus having a ball return mechanism of the type which includes an endless belt ball lift, a ball kicker assembly having a powered ball kicker wheel rotatably mounted on a pivotal shaft and a side kick back plate disposed proximate the ball kicker assembly, an improved ball kicker pressure device therein and therewith comprising:

(a) a rod having a first end and a second end, said second end adapted to be operably disposed against the ball kicker pivotal shaft;

(b) mounting means for mounting the device to the kickback plate, said mounting means slidably connected to the second end of the rod; and

(c) spring biasing means for exerting force between said rod and the mounting means, said spring biasing means operably connected between said mounting means and said rod.

4,179,121

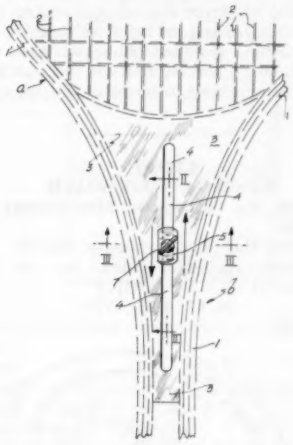
TENNIS RACKET WITH ADJUSTABLE WEIGHT

Pedro Kelmanski, Buenos Aires, Argentina

Filed Nov. 22, 1977, Ser. No. 854,013

Int. Cl.[2] A63B *49/04*

U.S. Cl. 273—73 R **3 Claims**



1. A tennis racket comprising a racket head and a racket handle extending from said head toward a grip remote from said head, said handle including a flat member defining a longitudinal slot substantially aligned with the longitudinal axis of the handle and a counterweight means movable along said slot for adjusting the position of the center of gravity of the racket, said counterweight means comprising a pair of clamps having edge portions engaging opposite surfaces of said flat member on opposite sides of said slot, screw means connecting said clamps for movement toward and away from each other, and means for rotating said screw means by thumb and finger pressure, said edge portions of said clamps being tightened against said opposite surfaces of said flat member by tightening said screw means and said counterweight means being movable along said slot by loosening said screw means.

4,179,122

MARBLE GAME APPARATUS

Otis E. Ray, P.O. Box 40302, St. Petersburg, Fla. 33743

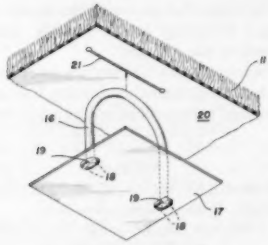
Filed Jun. 8, 1978, Ser. No. 913,688

Int. Cl.[2] A63F *7/00*; **A63B** *67/04*

U.S. Cl. 273—85 R **9 Claims**

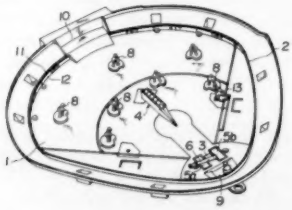
1. A game apparatus for use in playing several specifically different games utilizing rolling spheres propelled by knuckle or finger action, said apparatus comprising a flexible artificial grass mat adapted for placement on a level supporting surface

to thereby form a level and smooth playing surface on which spheres propelled by finger or knuckle action of players can roll, said artificial grass mat having a base sheet provided with spaced narrow slits arranged on the mat in the pattern of a miniature croquet course, and croquet wickets adapted for removable insertion upwardly through said slits from beneath said mat so that the bights and legs of the wickets project well



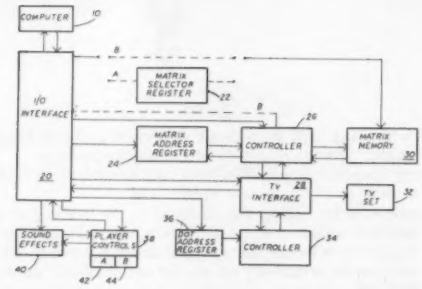
above said level and smooth playing surface and said spheres can be propelled by players through said wickets during the playing of croquet, and said mat being convertible to a playing surface for a pool-like game and/or a regular game of marbles by the removal of said wickets from said slits, and there being no discernible gaps or irregularities in said playing surface due to said slits.

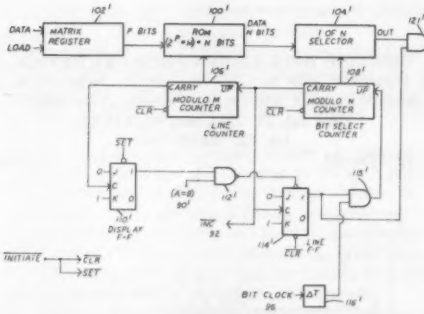
4,179,123
BASEBALL GAME BOARD
Mitsuo Tsukuda, No. 1-3, 3-chome, Moto-Asakusa, Taito-ku, Tokyo, Japan
Filed May 30, 1978, Ser. No. 910,775
Claims priority, application Japan, Sep. 16, 1977, 52-123540[U]; Sep. 16, 1977, 52-123541[U]
Int. Cl.[2] H63F 7/10
U.S. Cl. 273—89 **1 Claim**



1. In a baseball game board wherein a board resembling an actual baseball ground in shape is provided in which fielding bodies are located at the positions corresponding to a catcher and other infielders as well as outfielders, a pitching mechanism is installed at the position corresponding to a pitcher and a batting mechanism is disposed at the position corresponding to a batter, said batting mechanism being designed to hit a ball fed rollingly from said pitching mechanism as soon as it reaches the home base and a runner doll which is advanced to a base in response to a position which the batted ball reaches to score runs, the improvements comprising a batting mechanism consisting of a batting lever having racks on both sides of its front portion and pinions engaging said racks and said batting lever having an end protruding from the peripheral wall of the baseball game board to the rear side of the home base and the front end being connected by way of a coil spring to a shaft vertically provided in a bottom plate, both pinions being disposed by supporting a shaft for both pinions in a shaft hole of the board, and said both pinions being provided on its shaft with mounting holes for securing a bat support rod such that a bat is detachably secured to either one of said mounting holes, a pitching mechanism comprising an inclined groove which slants downwardly with respect to the home base and a means for receiving a plurality of balls which is provided on said inclined groove at a gentle gradient, the bottom of said means being arranged at a position lower than that of said inclined groove by one step and a groove being provided therebetween; a rod having the same inclined surface as in the bottom of said inclined groove and having a through hole in its side in the horizontal direction which rod is slidingly supported on the bottom plate such that its inclined surface is arranged at a position lower than the bottom of said means by one step so as to receive the forefront ball of the balls fed into said means and thereby prevent it from rolling down into said inclined groove and a pitching lever protruding outwardly from the outfield fence, the upwardly inclined portion of the front end of said pitching lever being inserted into said through hole and being connected by way of a coil spring to a shaft having an end vertically provided in the bottom plate whereby the rod is permitted to go up through traction of said pitching lever so as to feed a ball on said rod into said inclined groove so that the ball rolls down toward the home base, and a band-like rubber magnet plate with indications of HIT, 2BH and 3BH applied onto the front surface of the outfield fence, which holds a magnetic ball reaching the outfield fence by attraction.

4,179,124
ELECTRONIC VIDEO GAME
Jed Margolin, 96 Devonshire Ct., Somerville, N.J. 08876
Filed Dec. 12, 1977, Ser. No. 859,937
Int. Cl.[2] A63F 9/02
U.S. Cl. 273—101.2 **8 Claims**

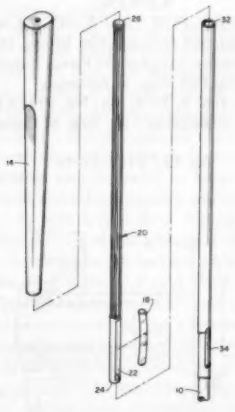




1. A player control for a TV game comprising:
a first cylindrical member having an outer surface and two ends;
a plurality of control switch members disposed on said outer surface in position to be operated by the fingers and thumb of a player; and
a loudspeaker disposed in one end of said cylindrical member for providing the player with audio signals relating to the TV game.

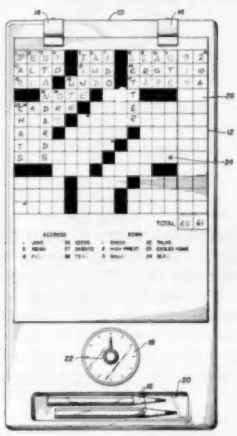
2. Playing apparatus that comprises in combination:
a television receiver operable within a channel for television broadcasting having an image screen;
an electronic controller for generating horizontal (X) and vertical (Y) coordinates of a point on said image screen;
an electronic interface interconnecting said electronic controller with said television receiver;
a matrix address means interacting with said electronic controller;
a display address means interacting with said electronic controller;
a matrix memory means interacting with said electronic controller;
said controller including a data comparator means for comparing the outputs of said display address means and said matrix address means such that said matrix memory means may produce an appropriate output for display on said image screen when said display address means and said matrix address means outputs are equal;
a matrix selector register means having P bits providing an input to said matrix memory means, said matrix memory means having a bit storage capacity of at least 2^P times M times N bits where 2^P is the number of matrices to be stored, M is the vertical bit size and N is the horizontal bit size of the matrix to be displayed;
said electronic controller further including a "1 of N" decoder responsive to said matrix memory means, a modulo M binary counter operative to provide an output to said matrix memory means, and a modulo N binary counter operative to provide an output to said "1 of N" decoder; and
logic circuit means for controlling the output of said "1 of N" decoder in a selected sequence.

4,179,125
LEVEL-INDICATING PUTTER
Bryan N. Cone, Carpinteria, and Michael F. Aboussouan, Lake View Terrace, both of Calif., assignors to Michael F. Aboussouan, Lake View Terrace, Calif.
Filed Mar. 17, 1978, Ser. No. 887,704
Int. Cl.[2] A63B *53/00*
U.S. Cl. 273—162 B **5 Claims**



1. A level-indicating putter comprising:
a shaft;
an offset head at one end of said shaft;
a grip at the other end of said shaft;
an insert mounted within and extending a substantial distance along the length of said shaft;
a receptacle preformed in and located near one end of said insert;
a levelling vial placed in said receptacle and exposed to view through a slot cut in the shaft; and
said insert so positioning said level within said shaft with respect to said offset head and grip that the vial is supported in a level position when the head and grip rest upon a level plane.

4,179,126
CROSSWORD PUZZLE GAME
Nina Coefield, 2225 Beech Dr., Great Falls, Mont. 59404
Division of Ser. No. 860,512, Dec. 15, 1977, Pat. No. 4,106,773, which is a continuation of Ser. No. 777,877, Mar. 15, 1977, abandoned. This application Mar. 9, 1978, Ser. No. 916,656
Int. Cl.[2] A63F *9/18*
U.S. Cl. 273—240 **5 Claims**

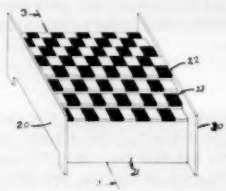


1. Apparatus for playing a competitive game, said apparatus comprising:
(a) a board;
(b) a plurality of sheets having crossword puzzles thereon releasably mounted on said board;
(c) a timer mounted on said board;
(d) at least two writing instruments capable of filling in said crossword puzzles in different colors;
(e) a retention compartment for said writing instruments carried by said board; and
(f) each of said sheets having at least two vertical columns or horizontal rows of blanks adjacent the crossword puzzle thereon for entry therein by respective writing instruments of the score achieved by the player using that writing instrument in the associated column or row of the crossword puzzle.

4,179,127
THREE DIMENSIONAL CHESS GAME APPARATUS
Vernon T. Goodman, 4820 Eastern La., Apt. 103, Suiteland, Md. 20023
Filed Jun. 13, 1978, Ser. No. 915,005
Int. Cl.[2] A63F *3/01*
U.S. Cl. 273—241 **3 Claims**

1. A gameboard for chess or checkers having an obverse side comprising a conventional checkerboard grid of square spaces, alternately colored in a checkered pattern, each row of said grid consisting of 8 said square spaces, the rows being in stepped configuration with the 2 outermost rows being at the lowest level, and each successively more inward row being raised an additional level from the preceding row, so that the centermost 2 rows are highest, said gameboard further having a reverse side comprising a grid identical to that on the obverse side in size and coloration but wherein successively more

inward rows are lowered one additional level from that of the preceding row so that the centermost 2 rows are lowest, the



elevations on the obverse side thereby corresponding to depressions on the reverse side.

4,179,128

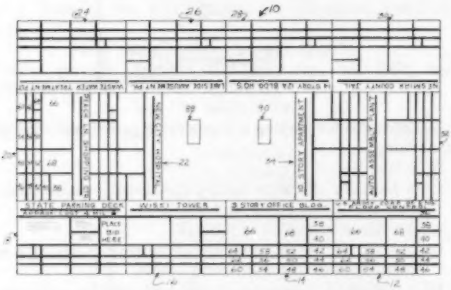
CONSTRUCTION BOARD GAME

David M. Zelazny, 7803 Stanelan, Detroit, Mich. 48228

Filed Sep. 26, 1977, Ser. No. 836,487

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—243 **5 Claims**



1. A game for a plurality of players, said game comprising:
a game board having a plurality of adjacent individual sections, each section comprising a self-contained playing course wherein no playing course extends into any adjacent section, only one of each of said players playing a playing course at one time;
a plurality of bid cards which each player selectively uses to bid so as to play one of said courses;
a plurality of game tokens, one for each player;
a plurality of sub-steps associated with each self-contained course and through which one token is moved, each of said substeps having indicia thereon distinct from the indicia on any other said substep, said one token being moved sequentially through each sub-step;
a plurality of instruction cards, each having indicia thereon, the indicia on each of said substeps corresponding to the indicia on one of said instruction cards, each card having a plurality of instructions which determine, by chance, the player's reward or penalty at each sub-step of said associated playing course; and
a plurality of chance cards providing selected rewards and/or penalties in addition to said instruction cards, at least one such card being drawn by a player during the play on each playing course.

4,179,129

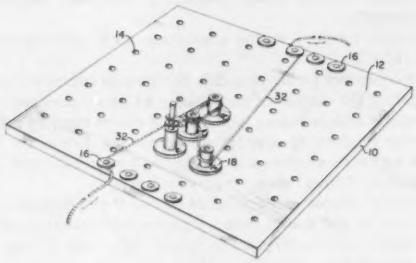
STRUCTURALIZATION OF RULES

Louie P. Loomis, 601 North View Terr., Alexandria, Va. 22301

Continuation of Ser. No. 844,037, Oct. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 683,335, May 12, 1976, abandoned. This application Aug. 30, 1978, Ser. No. 938,062

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—272 **1 Claim**



1. A word forming board game comprising a board having a rectangular matrix of evenly spaced apertures, a plurality of letter bearing apertured playing pieces, a plurality of peg structures receivable through the apertures in said playing pieces and in said board apertures to fixedly secure pieces selectively on the board, said pieces being locatable on said board in linear, non-linear, adjacent and/or non-adjacent arrays in accordance with prescribed placement rules to form words, tie means located along opposing edges of the board, and cord means having a ring at one end sized to receive said peg structures, said cord means being of sufficient length such that the cord means can be extended from a selected peg structure associated with a playing piece bearing the first letter of a word formed by playing pieces on the board, wrapped in sequence around peg structures associated with the playing pieces bearing successive letters of said word, and finally tied to one or the other of said tie means.

4,179,130

SEAL ASSEMBLY FOR TRACK-SEGMENT PIVOT

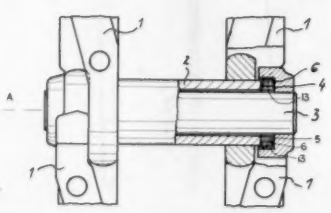
Carl Fass, Ennepetal, and Hansjoachim Brunn, Damme, both of Fed. Rep. of Germany, assignors to Firma Intertrac Viehmann & Co., Gevelsberg, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,083

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808159

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—84 **4 Claims**



1. A seal assembly comprising:
a pair of members relatively rotatable about an axis and together forming a radially outwardly opening groove having a pair of axially confronting flanks:
an annular nonmetallic and elastomeric seal in said groove having a pair of sides each engageable with a respective one of said flanks, formed between said sides with a radi-

ally outwardly open recess having a pair of axially confronting inner surfaces, and formed between said surfaces in said recess with a radially outwardly projecting ridge;

a pair of similar load-ring forming and oppositely directed dished washers spaced axially from each other in said recess and both bearing on said ridge, each washer lying flatly against the respective surface and being dished away from the other washer for pressing the respective sides of said seal into snug axial contact with the respective flanks of said groove.

4,179,131

SEAL ARRANGEMENTS

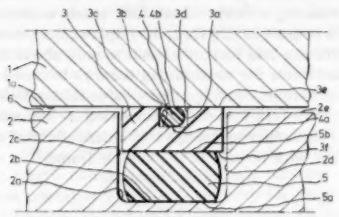
Thomas Nussbaumer, Zug, Switzerland, assignor to Patent & Inventions Ltd., Zug, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,191

Claims priority, application Switzerland, Nov. 23, 1976, 14689/76

Int. Cl.[2] **F16J** *15/16, 9/08*

U.S. Cl. 277—165 **12 Claims**



1. A seal arrangement comprising:

(a) a first sealing ring intended to locate in a groove in a first machine element and having a bearing surface by which said first sealing ring is bearable against the base of said groove of said first machine element, and a surface spaced from said bearing surface,

(b) a second sealing ring having a first bearing surface by which said second sealing ring is bearable against said spaced surface of said first sealing ring, and a second bearing surface which is spaced from said first bearing surface of said second sealing ring, contactable with surface portions of a second machine element and which is provided with an annular groove therein,

(c) a third sealing ring intended to locate in said annular groove of said second sealing ring and having a first bearing surface by which said third sealing ring is bearable against a wall portion of said groove of said second sealing ring, and a second bearing surface which is spaced from said first bearing surface of said third sealing ring and which is bearable against said second machine element, wherein said second sealing ring is formed of a deformable synthetic material and has a modulus of elasticity which is greater than the modulus of elasticity of said first sealing ring and greater than the modulus of elasticity of said third sealing ring, said modulus of elasticity of said second ring being in the range of 3000 to 25000 kiloponds per square centimeter, and wherein said third sealing ring is of such a size and shape that when said third sealing ring is located in said groove of said second sealing ring a radial spacing between said second bearing surface of said third sealing ring and said first bearing surface of said second sealing ring is at least equal to a radial spacing between said second bearing surface and said first bearing surface of said second sealing ring.

4,179,132

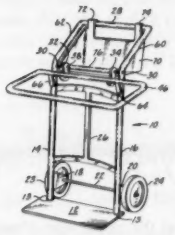
MULTI-PURPOSE HAND TRUCK

Robert L. Rich, 13371 Lucille St., Garden Grove, Calif. 92641

Filed Dec. 27, 1977, Ser. No. 864,465

Int. Cl.[2] **B62B** *1/14*

U.S. Cl. 280—47.26 **4 Claims**



1. A hand truck having a load platform, a pair of side support members extending upwardly from the load platform and a handle connected to the side support members, the improvement comprising:

a trash bag ring; and

means to pivotally support said trash bag ring in first and second predetermined positions, said first position being substantially parallel to, above and spaced from the load platform and said second position being rotated more than 90° upwardly therefrom, the support members each including upper portions which are slanted away from said trash bag ring when said trash bag ring is in its first position, said upper portions each forming an angle of less than 90° to its associated support member, said handle being connected to said upper portions, said second position of said trash bag ring placing said ring in contact with at least one of said upper portions of said support members, said means to pivotally support said trash bag ring including, an axle connected between said support members and a pair of attachment members pivotally connected to said axle and fixedly connected to said trash bag ring, said trash bag ring being formed from material which has a generally circular cross-section so that said ring also has a circular cross-section and upper and lower semi-circular surfaces wherein said attachment members are hook-shaped members, when in its first position said hook-shaped member pivots to said axle above said trash bag ring and is fixedly connected to said lower semi-circular surface thereof, and said hand truck further including at least one stop member extending downwardly from said ring when said ring is in said first position, said stop member including a sidewardly facing abutment surface which engages one of said support members when said trash bag ring is in said first position.

4,179,133

APPARATUS FOR CONVERTING A SKATEBOARD INTO A SCOOTER

Robert B. Robb, P.O. Box 385, Oroville, Calif. 95965

Filed Mar. 20, 1978, Ser. No. 888,014

Int. Cl.[2] **B62K** *9/00*

U.S. Cl. 280—87.04 R **15 Claims**

1. Apparatus for converting a conventional skateboard having a platform and wheels to a scooter comprising:

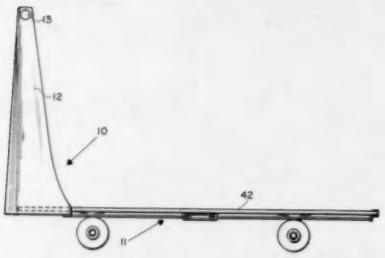
a skateboard-receiving support means having a skateboard retaining member at one end,

an upright member, mounted at the other end of said support means,

said support means being longitudinally adjustable between said upright member and said retaining member;

said upright member having a skateboard retaining portion adjacent the support means, both said retaining member

and said retaining portion being aligned in a horizontal plane for securing a skateboard therebetween; and



handle means at the upper end of said upright member extending transverse to the longitudinal axis of said upright member.

4,179,134

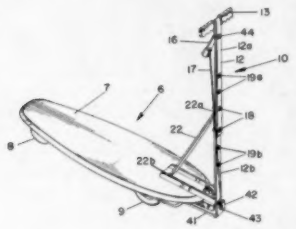
REMOVABLE TRAINER HANDLE AND BRAKE FOR SKATEBOARD

Wallace E. Atkinson, Rte. 3, Box 656, Petersburg, Va. 23803

Filed Jul. 26, 1978, Ser. No. 928,306

Int. Cl.[2] A63C *17/14*

U.S. Cl. 280—87.04 A **5 Claims**



1. The combination of a trainer handle and brake for removable attachment to a skateboard and the like, the skateboard having transversely spaced front and rear wheel sets comprising:

a handle strut;

a handle bar fastened to one end of said strut;

clamping means secured at the other end of said strut for clamping said strut to the front end of a skateboard in upstanding relation thereto, said clamping means including an upper jaw extending substantially perpendicular to said strut, a lower jaw underlying said upper jaw, and means for moving said jaws together and apart for attaching and detaching said clamping means relative to the front end of the skateboard;

a pair of transversely spaced brake shoes, means pivotally supporting said spaced brake shoes beneath the lower jaw of said clamp to overlie the front wheels of the skateboard;

a lever arm connected to said brake shoes;

a brake handle pivotally supported on said handle strut adjacent said handle; and

brake operating linkage means connecting said brake handle with said lever arm for pivoting said brake shoes against the top of said front wheel set when said brake handle is actuated from a normal position and for disengaging said brake shoes from said front wheel set when said brake handle is released,

said upper and lower jaws being elongated channel members the upper jaw channel member being open in the upper direction and the lower jaw channel member being open in the downward direction, the end of said strut to which the clamping means is secured having a rigid right angle extension secured in one end of said upper jaw channel member and said brace having a base portion secured in the other end of said upper channel member from said right angle extension.

4,179,135

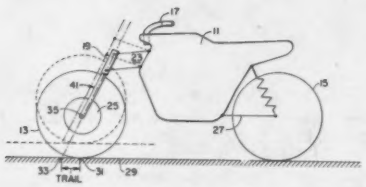
MOTORCYCLE FRONT WHEEL SUSPENSION SYSTEM

John Slater, Hulme 6-C Escondido Vil., Stanford, Calif. 94305

Filed Jan. 13, 1978, Ser. No. 869,041

Int. Cl.[2] B62K *11/12*

U.S. Cl. 280—276 **14 Claims**



1. In a vehicle having a passenger carrying frame, front and rear wheels and steering handlebars pivotably mounted on said frame for rotating a front wheel fork about a steering axis defined with respect to said fork, the improvement comprising means connecting said fork at a position only above the front wheel to said frame for constraining the fork to move relative to said frame with its steering axis movable substantially parallel to itself, such fork movement occurring in response to the front wheel encountering bumps and independent of any rear wheel motion with respect to the vehicle frame.

4,179,136

SEAT BELT SYSTEM

Fumio Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

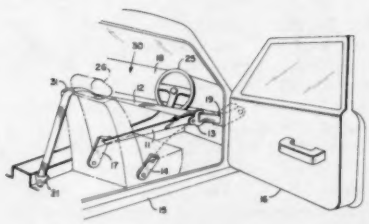
Division of Ser. No. 796,325, May 12, 1977, Pat. No. 4,124,224.

This application Aug. 3, 1978, Ser. No. 930,852

Claims priority, application Japan, May 26, 1976, 51-61556

Int. Cl.[2] B60R *21/02*

U.S. Cl. 280—744 **5 Claims**



1. A seat belt system for a motor vehicle comprising:

a lap restraining belt anchored at one end to adjacencies of a rear bottom portion of a seat of said motor vehicle and adjacent a center line of said vehicle;

a shoulder restraining belt anchored to adjacencies of said anchored end of said lap belt and extending over a top portion of said seat;

a retractor for retracting said lap and shoulder belts, said retractor being provided forward of said seat and adjacent a door of said motor vehicle such that said lap and shoulder belts extend obliquely from one side of said seat to the other side of said seat;

a tongue plate coupled to said lap and shoulder belts; and

a buckle provided adjacent said door and to the rear of said seat for engagement with said tongue plate whereby a

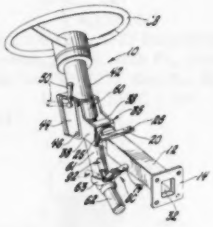
driver is prevented from operating said vehicle when said seat belt system is not in use.

4,179,137

ADJUSTABLE STEERING COLUMN FOR VEHICLES

Harold J. Burke, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1978, Ser. No. 937,485
Int. Cl.[2] B62D 1/18
U.S. Cl. 280—775 **4 Claims**



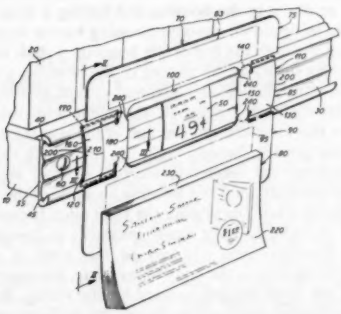
1. An adjustable steering column for a vehicle comprising a first tubular member rectilinear in cross section, fastener means for attaching one end of said first tubular member to the vehicle, a second tubular member rectilinear in cross section mounted for sliding telescopic movement with respect to said first tubular member, a steering column housing secured to the projecting end of said second tubular member and projecting therefrom, a steering wheel supported at the upper end of said steering column housing, a steering shaft attached to said steering wheel extending through said steering column, a brakeshoe operatively disposed between the inner and outer tubular members, and actuator means operatively connected to said brakeshoe for exerting a diagonal force across said tubular members so that two adjacent surfaces of said members are in close frictional engagement with each other to thereby releasably couple said tubular members at an adjusted telescoped position and the steering wheel at a selected translated position with respect to said outer support member.

4,179,138

RAIL STRIP AND LOCKING DEVICE

George Bogdanovic, Lyons, Ill., assignor to Jet Press, Inc., Berkeley, Ill.

Filed Mar. 17, 1978, Ser. No. 887,930
Int. Cl.[2] A47F 7/00
U.S. Cl. 281—15 B **23 Claims**



1. A strip for use with a rail having a top and bottom groove comprising:

a piece of sheet stock;

said piece of sheet stock having at least a first and second tab defined thereon;

each of said first and second tabs having three connected sides separated from said piece of sheet stock;

said second tab being foldingly alignable with respect to said first tab by being folded so as to be laterally disposed with and adjacent to said first tab;

said first tab being joined to said second tab along said fold;

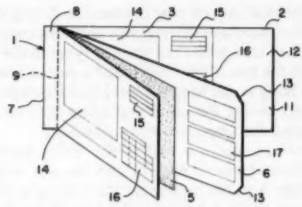
said three sides of said first and second tabs having preselected dimensions with said first and said second tab being removably engageable with the top and bottom groove of the rail.

4,179,139

COMBINATION CHECK AND CREDIT CARD SALES SLIP

Eugene J. Savar, and Cindy Savar, both of 11B Ivy Ct., Mapleshade, N.J. 08052

Filed Nov. 6, 1978, Ser. No. 958,098
Int. Cl.[2] B41L 1/24
U.S. Cl. 282—23 R **17 Claims**



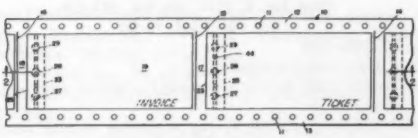
1. A financial transaction package comprising a plurality of superposed sheets, a first sheet being printed as a check blank on one side, and being printed with a credit card sales slip blank on the reverse side, and a second sheet being positoned adjacent said credit card sales slip blank and printed with a credit card receipt blank.

4,179,140

FORM SUITABLE FOR AIRLINE TICKETING

Donald J. Steidinger, Barrington, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Continuation of Ser. No. 483,952, Jun. 28, 1974, Pat. No. 4,109,936, which is a continuation-in-part of Ser. No. 453,556, Mar. 21, 1974, which is a continuation-in-part of Ser. No. 374,274, Jun. 27, 1973. This application Jun. 12, 1978, Ser. No. 914,437
Int. Cl.[2] B41L 1/20
U.S. Cl. 282—11.5 R **3 Claims**



1. A form suitable for processing to provide airline ticketing, comprising:

an elongated web having a plurality of equally longitudinally spaced lines of weakness extending transversely to provide discrete ticketing panels,

a plurality of generally rectangular, superposed plies of web material for each panel,

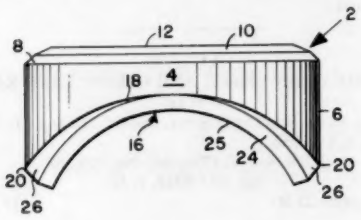
said plurality of plies and the associated panel being secured together with said panel providing one exterior of said

form, alternate of said pluralities of plies having more plies than the intervening pluralities.

4,179,141
BRANCH CONNECTION FITTING

John W. Newman, Wayne, Pa., assignor to Allied Piping Products Company, Inc., Marshall, Tex.

Filed May 4, 1978, Ser. No. 903,026
Int. Cl.[2] F16L *5/00, 13/02, 27/00, 47/02*
U.S. Cl. 285—189 **4 Claims**



1. In a cylindrical branch pipe connection fitting for use with a header pipe of substantially uniform wall thickness having at one end a pair of ears with their centers lying in the transverse plane through the axis of the fitting, and a pair of crotches with their centers lying in the longitudinal plane through the axis of the fitting, and having the other end adapted to be connected to a branch pipe the improvement comprising:

a weld bevel on said one end of the fitting extending outwardly from the inner edge of said one end with the weld bevel angle A in the transverse plane being in the range of from about angle B between the axis of the fitting and a line from the intersection of the axes of the header pipe and fitting to an inner edge of the weld bevel in said transverse plane to about angle B plus 40° with the portions of the weld bevel outside of the transverse plane having a bevel angle in the range of from about weld bevel angle A to about weld bevel angle A minus 20°,

a pair of transition bevels each extending from the center of an ear towards the centers of the crotches with the outer edge of the transition bevel gradually approaching and intersecting the outer edge of the weld bevel,

the bevel angle of each transition bevel being in the range equal to weld bevel angle A divided by from about 1.75 to 2.5 and the maximum depth of each transition bevel being at the center of the ear and being from about 0.2 to about 0.5 times the maximum wall thickness of the fitting and the fitting having a maximum wall thickness in the range of from about 95% to about 350% of the header pipe.

4,179,142
FLEXIBLE PIPE FITTING

Edgar Schopp, 2210 Gratton St., Riverside, Calif. 92504

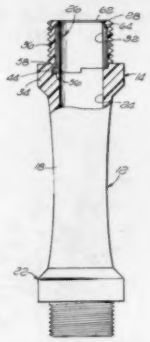
Filed Jun. 6, 1977, Ser. No. 803,426
Int. Cl.[2] F16L *33/00*
U.S. Cl. 285—239 **2 Claims**

1. A pipe fitting comprising:

a flexible body having a threaded coupling section at one end thereof;

said coupling section having a portion thereof integrally formed with said flexible body and wherein a continuous bore is formed in said flexible body and said coupling section; and

a rigid shape-retaining portion defining a portion of said continuous bore, said rigid shape-retaining portion including an annular sleeve whose inner surface defines a portion of said continuous bore and whose outer surface and terminal ends are juxtaposed with said coupling section enabling said coupling section dimensions to remain relatively constant when a member is secured to the threaded portion of said coupling section, said coupling section being molded around the outer surface and terminal ends of said rigid shape-retaining portion, said rigid shape-retaining portion further including at one terminal end a partial arc section flange extending radially outwardly from said outer surface and having radially extending ends defining the limit of said partial arc section flange, said

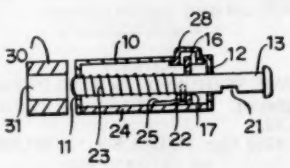


flange formed on said annular sleeve in a plane intersecting the axis of said bore for preventing movement of said sleeve with respect to said flexible body in a direction parallel to the axis of the bore, said molded portion of said coupling section being juxtaposed with said radially extending ends of said flange for preventing said rigid shape-retaining portion from rotating about said bore axis.

4,179,143
FIXED LATCH LOCK

Min C. Shy, No. 20, Alley 18, Lane 109, Hoping St., Yang Ho Town, Taipei, Taiwan

Filed Jan. 31, 1978, Ser. No. 873,981
Int. Cl.[2] E05C *1/10*
U.S. Cl. 292—179 **3 Claims**



1. A latch lock comprising a housing with a front end and a rear end and a hole at each of said ends, a controlling plate movable up or down in the housing and having a fixing hole therethrough, an up-down movable pressing button located at and extending through the top of the housing, a shaft latch, a bottom stand set firmly at the bottom of the housing, a spring sheet set firmly on the bottom stand and against said controlling plate, the shaft latch being in alignment with the holes located at the front end and the rear end of the housing and the fixing hole and passing therethrough; the shaft latch having a U-shape notch on the underside thereof; a small abutment extending on the shaft latch at a location away from the notch; a pressing spring extending around the shaft latch between the front of the housing and the small abutment in compressed relationship therebetween; whereby as the notch is passed through the fixing hole in the controlling plate, the controlling plate taking the force pushed upward by the spring sheet set firmly on the bottom stand will be driven upwardly toward the notch on the shaft latch, until the notch of the shaft latch engages in the fixing hole on the controlling plate, the pressing button upon being pressed operates to push the controlling plate down so that the notch on the shaft latch disengages from

the fitting position with the controlling plate and the shaft latch will take the force of the pressing spring at the front end and will press back to where it was automatically from the latching position with said fixing hole being located in the center of the controlling plate, a projection extending from the top of the controlling plate receiving the pressing button, two notches are formed at the bottom of the controlling plate with projecting edges on both sides of said notches respectively to inlay the controlling plate in a guiding channel in the housing so that the controlling plate can move freely along the guiding channel.

4,179,144

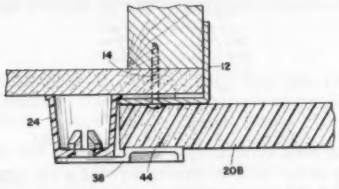
REMOVABLE COVER AND HOLDER THEREFOR

Donald L. Henderson, 2536 E. 56th Pl., Tulsa, Okla. 74105

Filed Nov. 21, 1977, Ser. No. 853,220

Int. Cl.[2] E05C *3/04*

U.S. Cl. 292—202 **4 Claims**



1. A device for supporting a removable panel over an opening in a wall, comprising:

a longitudinal hollow boss member having a top end adapted to engage the wall and a bottom end, the boss member having a leg portion integrally extending therefrom at said wall engaging top end, the leg portion extending perpendicular the longitudinal axis of the boss member, the leg portion comprising a first portion and a parallel second portion, the two portions having their ends adjacent the boss member joined such that the leg portion is substantially in the shape of a "U"; said first and second portion spaced apart sufficiently that the leg portion may be slid under a screw head or the like whereby the boss member is attached to a wall adjacent an opening to be closed;

and an arm member having the inner end pivotally secured to the bottom end of said boss portion and extending in a plane parallel said boss leg portion, the outer end is configured of an integral wedge, the upper surface of which is in a plane inclined at an angle to the plane of the arm whereby when the arm is pivoted to engage a panel the wedge portion engages the panel to facilitate pivotation of the outer end of the arm over the panel.

4,179,145

SANITARY DOG LITTER BAGGER

Joe H. Shinsako, 171 W. 79th St., New York, N.Y. 10024

Filed Aug. 15, 1978, Ser. No. 933,862

Int. Cl.[2] A01K *29/00*

U.S. Cl. 294—19 R **9 Claims**

1. A sanitary manual scoop and dog litter bagger comprising a hollow rectilinear barrel, a partially rotatable member, said partially rotatable member being mounted at one end of said barrel, said partially rotatable member having a hollow rectilinear leg and a handle, said hollow rectilinear leg being partially rotatable about its longitudinal axis, said handle extending substantially transverse to said leg and being attached to the terminal end of said leg, said barrel and said leg being coaxially aligned in tandem and abutting, a sleeve, one end of said sleeve being attached to the end of said leg which abuts said barrel and extending coaxially within said barrel, the outer surface of said sleeve being contiguous with the inner surface of said barrel, so that said sleeve is slidably displaceable both longitudinally and partially rotatably within said barrel, an axle, said axle being mounted to said barrel adjacent the other end of said barrel and extending substantially transversely through said barrel and said sleeve, the other end of said sleeve extending beyond the other end of said barrel, a substantially rectilinear resilient elastic member, said elastic member extending within said sleeve and said leg, means attaching one end of said elastic member to said axle, means attaching the other end of said elastic member to said handle, said sleeve having a pair of opposed longitudinal slots adjacent its other end, said axle extending through said slots, the end of each of said slots which is juxtaposed with the other end of said sleeve having a lateral extension, so that sleeve retention recesses are defined by said lateral extensions, said axle extending into said recesses when said elastic member is elongated by longitudinal displacement of said partially rotatable member away from said barrel and subsequent partial rotation of said partially rotatable member, with concomitant partial rotation of said sleeve, a rectangular planar baffle, said planar baffle being centrally mounted to the other end of said sleeve so that said sleeve is substantially perpendicular to said planar baffle, a pair of opposed scoops, and opposed lateral means mounting each of said scoops to both adjacent corners of said planar baffle and pivotally to the ends of said axle, so that when said partially rotatable member is displaced away from said barrel, the free ends of said scoops are retracted away from each other, a deformable open-mouthed bag being mountable on said scoops with the bottom of said bag adjacent said planar baffle, so that when said barrel and the leg of said partially rotatable member are abutting, the free ends of said scoops are juxtaposed.

4,179,146

POT HANDLE

Wolfgang Fischbach, Daaden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten,Eisen- und Blechenwaren Fabrik, Neunkirchen, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,457

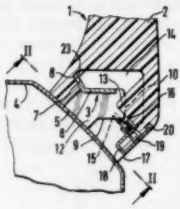
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729269

Int. Cl.[2] A47J *45/06*

U.S. Cl. 294—27 H **5 Claims**

1. In a pot handle comprising a handle member having a recess therein and a support bar received in said recess and which is permanently connected to said pot and which has at least one hook, the free end of which extends substantially parallel to the pot wall and cooperates with a suitably constructed shoulder on said handle member and a spring to effect a holding of said handle member on said support bar, the improvement comprising wherein said support bar has two sloped surfaces which form an obtuse angle with one another on a side of the support bar which is opposite the hook,

wherein a spring is arranged in said recess and cooperates with said sloped surfaces, said handle having an undercut section in said recess, said spring being guided in said undercut section which opens outwardly to facilitate an insertion of said spring into said undercut section, said spring being tensioned during movement of said handle onto said support bar with the aid of



one of the two sloped surfaces, said spring gripping toward the end of the movement of said handle onto said support bar behind the other surface and urges said handle on the one hand against the pot and on the other hand against said support bar, said spring being supported on the one side thereof on the sloped surface and on the other side on a movable clip, which clip covers the outwardly opening part of the undercut section.

4,179,147

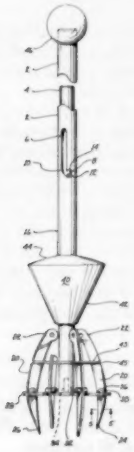
GOLF GREEN TOOL

Arthur L. Mendenhall, 4132 Gary Rd., Salt Lake City, Utah 84117

Continuation of Ser. No. 787,812, Apr. 15, 1977. This application May 30, 1978, Ser. No. 910,488

Int. Cl.[2] A01B *1/16*

U.S. Cl. 294—50.7 **10 Claims**



1. A tool for raising green indentations comprising, in combination, a pair of relatively moveable telescoping members; a handle carried by the outer one of said telescoping members; a plurality of fingers fulcrumed in angularly spaced relation on means carried by the inner one of said members, their lower ends approaching each other but not touching in operating relationship; means defining a plane inclined from the axis of said members bearing on the upper ends of said fingers to positively move said fingers by relative movement of said members; resiliently deformable means connecting the upper ends of said fingers and urging them radially inward; said outer telescoping member having means defining a longitudinal slot, a pocket offset to one side of said slot and at the lower end thereof, a pin carried by said inner member disposed to travel in said slot and to lodge in said pocket; said pocket having means for preventing significant axial movement of said pin such that rotation of the members relative each other is required to move said pin from said pocket into said slot.

4,179,148

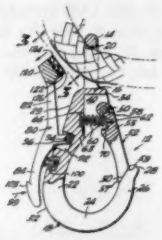
SNAP HOOK

Robert J. Johnson, 3245 Virginia St., No. 2, Coconut Groove, Fla. 33133

Filed Jul. 14, 1978, Ser. No. 924,651

Int. Cl.[2] B66C *1/36*

U.S. Cl. 294—78 R **10 Claims**



1. A snap hook comprising a body having a first end zone comprising an eye with an opening defining a line passageway and a second end zone comprising a J-hook portion, said hook portion and eye being connected together at a zone of juncture,

said hook portion including a first leg portion extending generally axially away from said zone of juncture and said eye and a shorter second leg portion spaced from said first leg portion, and a generally U-shaped portion spaced from said zone of juncture between said leg portions and defining a hook bite,

said second leg portion having a terminal end zone spaced from said zone of juncture and said terminal end zone having an abutment surface confronting said first leg portion,

said zone of juncture having a first surface common with said first leg portion and a second opposite surface and a pair of outer surfaces extending between said first and second opposite surfaces, and said zone of juncture having a first recess in the second opposite surface between the outer surfaces and a first pin spanning said recess in perpendicular relation generally to said outer surfaces;

a latch arm of rigid material of a length greater than the distance between said first pin and said terminal end zone of said second leg portion and having a first end and a second end, said first end having a lateral hole sized for passage and rotatable on said first pin and said second end having an abutment surface in confronting engagement with the abutment surface of said terminal end zone of said second leg portion;

spring means normally urging said abutment surfaces into abutting engagement and said latch arm being yieldable swingably away from said second leg portion and toward said first leg portion to accommodate snap hook movement of said latch arm to automatically open and close the bite of the snap hook; and the improvement which resides in,

said first leg portion having a first and second main surface common with the outer surfaces of said zone of juncture and a recess in the first surface common with said first surface of said zone of juncture and between said first and second main leg surfaces and second pin means spanning said recess, said second pin means having a centerline spaced from said eye opening a predetermined distance,

a keeper arm having a first end and a second end and an intermediate zone between said first and second end, said keeper arm comprising a rigid member and including a

projection extending from said intermediate zone and having a through hole, said projection and keeper arm being journaled on said second pin means, said second end of said keeper arm comprising an operator means for swinging movement of said keeper arm pivotally about said second pin means,

spring means captivated between said keeper arm and said hook portion normally urging said keeper arm into a predetermined normal position,

said first end of said keeper arm, when said keeper arm is in said perdetermined normal position being of a length from said second pin means at least as great as said predetermined distance to extend from said second pin means to said eye opening and said first end of said keeper arm having a terminal foot with an abutment surface confrontingly arranged in blocking relation at said eye opening and adapted to be moved into and out of clamping engagement of a line passed through said eye and yieldably movable upon swinging movement of said keeper arm to open passage through the eye to clampingly engage a line.

4,179,149

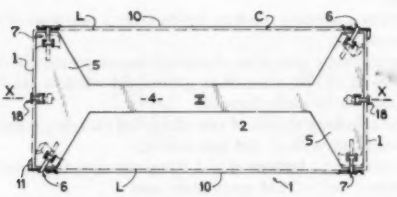
SUSPENDED SEIZING DEVICE OR THE LIKE

Felix A. Brochard, Nantes, France, assignor to Brissonneau & Lotz Marine S. A., Carquefou-Nantes, France

Filed Jun. 2, 1978, Ser. No. 911,942

Int. Cl.[2] B66C *1/66*

U.S. Cl. 294—81 SF **12 Claims**



1. A seizing device comprising a frame, means for suspending the frame from handling means for the purpose of bringing the frame into a position of coincidence defined by at least one frame-locating element of a structure to be seized, for example an edge of a container, and at least two arms disposed on a side of the frame and in spaced relation to each other on said side of the frame, the arms being provided for placing alongside the locating element in said position of coincidence, and flexible and elongated guiding means interconnecting the arms and capable of contacting and cooperating with the locating element so as to guide the frame toward said position of coincidence.

4,179,150

SAFETY ARMING DEVICE FOR MISSILES

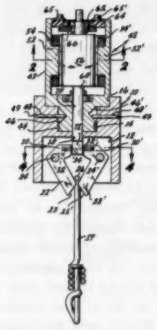
Coleman W. Conrad, Whittier, and Edward W. Fenska, Altadena, both of Calif., assignors to IMC Magnetics Corporation, Los Angeles, Calif.

Filed Oct. 31, 1977, Ser. No. 846,712

Int. Cl.[2] B66C *1/38*

U.S. Cl. 294—83 R **15 Claims**

1. In an electrically actuated control device, in combination, holding means including at least one pivotally movable holding member, a second member with which the said one member cooperates, said first and second members having portions constructed for relative movement for purposes of releasing, the improvement comprising means to control relative movement of said portions, said last means including an element having an axis mounted to be movable angularly about its axis, the said element having a configuration such that in one position said portions are permitted to move for releasing and in



another position said portions are held from moving, and electrical means for actuating said element.

4,179,151

ANCHOR INSERT FOR EMBEDMENT IN A CONCRETE SLAB

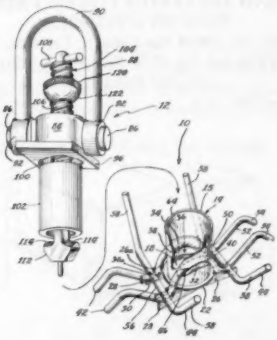
Dennis W. Tye, Fremont, Calif., assignor to Superior Concrete Accessories, Inc., San Diego, Calif.

Continuation of Ser. No. 568,585, Apr. 16, 1975, abandoned, which is a continuation of Ser. No. 435,700, Jan. 23, 1974, abandoned. This application Jan. 10, 1978, Ser. No. 868,315

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] B66C *1/66*

U.S. Cl. 294—89 **6 Claims**



6. An anchor insert adapted to be embedded in a concrete slab for cooperation with a pick-up unit which includes a locking stem having a pair of lift shoulders extending from opposite sides of the stem, said insert comprising:

a concrete-excluding cage which includes a single-walled hollow body and a base closing one end of the body, the opposite end of said body being adapted for insertion of said locking stem and lift shoulders into the cage, said cage being adapted to be emplaced within a form for a concrete slab with its base lowermost in the form,

a pair of spaced apart single-walled shoulders formed in the wall of said cage body on opposite sides of the body and spaced from said base, said body shoulders extending inwardly of the body to define a pair of downwardly facing downwardly curved arcuate internal thrust surfaces on one side of said wall each adapted for lifting engagement in contact with one of said lift shoulders, said body shoulders also defining a pair of upwardly facing

downwardly curved arcuate external lift surfaces on the reverse side of said wall each adapted for lifting engagement in contact with a section of an anchor rod,

a first pair of spaced apart anchor rod sections each including a central portion defining a downwardly facing thrust surface contacting one of said lift surfaces on the body, a transition portion extending from each of the opposite ends of the central portion, a reverse bend portion extending from each transition portion, an extension portion extending from each reverse bend portion, and a terminal portion extending from each extension portion,

said central portions each being curved downwardly substantially on the arc of a circle and having ends extending downwardly and outwardly at small angles from the vertical, and said transition portions extending downwardly and outwardly at small angles from the vertical, thereby to provide for the transmission to the anchor rod sections of initial lifting forces with relatively large vertical components of force and relatively small horizontal components of force, and extension portions extending upwardly and outwardly, said terminal portions extending downwardly and outwardly, and

a second pair of spaced apart anchor rod sections extending transversely of said first pair of anchor rod sections and fixedly secured thereto on opposite sides of said cage body, said pairs of anchor rod sections thereby being securely mounted on said cage,

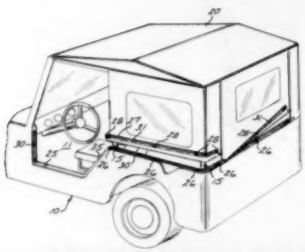
whereby said locking stem of a pick-up unit may be inserted in said cage with said lift shoulders disposed beneath said body shoulders, said lift shoulders may be brought into lifting engagement in contact with said thrust surfaces on the body, and a lifting force when imparted to said locking stem is transmitted to said anchor rod sections for lifting a slab in which the insert is embedded.

4,179,152

METHOD AND APPARATUS FOR SECURING FABRIC TOPS TO A VEHICLE

James K. Kent, Jr., 18014 San Gabriel, Cerritos, Calif. 90048

Filed Jul. 13, 1977, Ser. No. 815,201
Int. Cl.[2] B60J *1/20*
U.S. Cl. 296—196 **1 Claim**



1. In a vehicle including a passenger receiving cavity and a deployable fabric top, said top including a plurality of spaced grommets above the edges thereof for receiving corresponding fasteners disposed along the periphery of said cavity, the improvement comprising:

a plurality of elongate strips of pile dimensioned for receipt between adjacent ones of said fasteners;

a corresponding plurality of elongate strips of semi-rigid backing adhesively secured to associated ones of said strips of pile, each said strip of backing being, in turn, attached to the periphery of said cavity in interspaced relationship between said fasteners for supporting said strips of pile in exposed alignment;

a plurality of elongate strips of loop material attached to said top in interspaced disposition between adjacent ones of said grommets said strips of loop material being disposed on the surfaces of said top opposing said strips of pile for unbedding therein;

said loop strips and said strips of pile are conformed to substantially identical plan forms; and

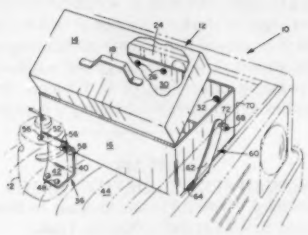
said strips of backing are secured to the periphery of said cavity by adhesive.

4,179,153

TOOL BOX CARRYING APPARATUS AND METHOD

Bert Cole, Jr., 1353 W. French Pl., San Antonio, Tex. 78201

Filed Apr. 3, 1978, Ser. No. 892,669
Int. Cl.[2] B60R *5/00, 7/00;* **B23P** *19/00*
U.S. Cl. 296—37.1 **11 Claims**



1. A method of mounting a tool box under a hood of an automobile having a pickup type front comprising the following steps:

removing a window washing bottle from a side wall of said automobile;

first attaching a side of an elongated carrying means to said side wall of said automobile where said window washing bottle was formerly located;

second attaching an end of said elongated carrying means to a front end wall of said automobile;

third attaching a bottom of said elongated carrying means to a wheel well of said automobile; and

relocating said window washing bottle under said hood.

6. An apparatus for mounting a tool box under a hood of an automobile having a pickup truck type front comprising:

tool box carrying means having a box like structure with box sides and a bottom;

securing means connecting a first of said box sides of said tool box carrying means to a side wall of said automobile;

first bracket means connecting to a front of said bottom of said tool box carrying means and extending generally upward to connect to a front wall of said automobile;

second bracket means connecting to a rear of said bottom of said tool box carrying means and extending generally downward to connect a wheel well of said automobile; and

means for amounting adjacent to a second of said box sides of said tool box carrying means said means for mounting being adapted to secure a window washing bottle to said tool box carrying means.

4,179,154

AIR VELOCITY RESPONSIVE DEFLECTOR

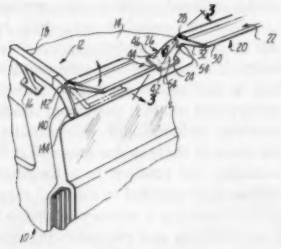
Charles E. Ingram, Warren, Mich., assignor to Four Star Corporation, Troy, Mich.

Filed Nov. 4, 1977, Ser. No. 848,402
Int. Cl.[2] B60J *1/20*
U.S. Cl. 296—91 **27 Claims**

1. In a luggage carrier of the type comprising an air deflector blade, the improvement which comprises:

means for rendering the deflector blade rotatable between a substantially vertical position and a substantially horizontal position in response to the velocity of air flowing

therepast, the blade being rotatable from the vertical position to horizontal position as the velocity of the air



impinging thereagainst increases, the blade being adapted to minimize the drag created thereby.

4,179,155

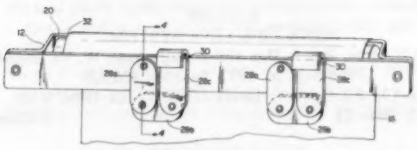
LIGHT SHADE MOUNTABLE IN A PLURALITY OF POSITIONS ON A PLURALITY OF ITEMS IN AN AUTOMOBILE

Jose E. Ortiz, 6422 Virginia Hills Ave., Alexandria, Va. 22310

Filed Jul. 18, 1978, Ser. No. 925,861

Int. Cl.[2] B60J *3/02*

U.S. Cl. 296—97 C **9 Claims**



1. A light shade mountable in a plurality of positions on a plurality of items inside an automobile such as on a sun visor or on a side windowpane of a wide window opening and having a reversible mounting means with an extended first position for attachment to the top edge of the sun visor when said visor is in a downward position and a reverse, upside down position wherein said mounting means is shortened for attachment to the upper edge of the windowpane, and means so that when mounted to said windowpane with the windowpane in the up position the uppermost portion of the window opening is coverable, said light shade comprising a frame, a storage member having a circumference and rotatably supported by the frame, a flexible light attenuating screen wound about the circumference of said storage member, and a screen supporting member supported by at least one of the mounting means and the frame and disposed so that when the lightshade is mounted in the reverse upside down position on the windowpane and the windowpane is in an up position with said supporting member extending above the uppermost portion of the window opening and when the screen is unwound from about said storage member, said screen extends over and is supported by said screen supporting member and hangs downward therefrom covering at least the uppermost portion of the window opening thereby to modify incoming sun's rays reaching the driver by holding said screen interposed between the driver and a glass surface of the automobile without an uncovered gap in the uppermost portion of the window opening to protect the driver from the sun's rays whether the shade is mounted on the visor in said first position or on a side window in said reverse upside down position and whereby a short length of the screen member is almost completely disposed over the window area in either position.

4,179,156

VEHICLE SUN ROOF COVER

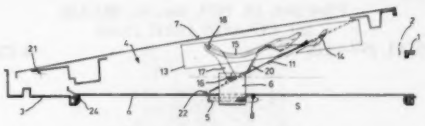
Marinus Huisman, Braunschweig, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,422

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2648664

Int. Cl.[2] B60J *7/04*

U.S. Cl. 296—137 B **6 Claims**



1. A displaceable cover for an automobile roof, capable of being longitudinally displaced to open and close a roof opening and having a rigid outer top member capable of being pivoted outward from said roof opening about a first axis at one longitudinal end of said cover and an inner panel member covering said opening from the vehicle interior when said cover is closed, said panel member having first and second panel portions pivotably mounted to each other on a second axis transverse to the direction of said longitudinal displacement, said first panel portion being mounted on said cover so that it remains substantially parallel to said roof at all cover positions and said second panel portions being mounted on and interacting with said cover so that it remains parallel to said first panel portion when said cover is longitudinally displaced to open and close the roof opening and so that it pivots outward on said second axis with respect to said first panel portion when said cover is pivoted outward from said roof, thereby opening a passage through said panel member.

4,179,157

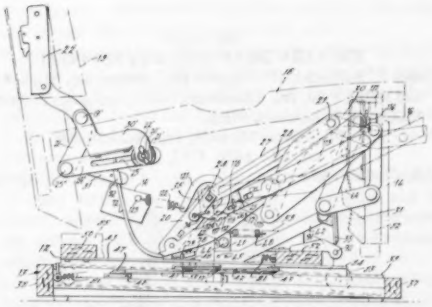
WALL RECLINING ROCKING CHAIR

Edwin J. Shoemaker; William Pacitti, and Marvin J. Baumann, all of Monroe, Mich., assignors to La-Z-Boy Chair Company, Monroe, Mich.

Filed May 8, 1978, Ser. No. 903,806

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—83 **11 Claims**



1. In a wall reclining rocking chair, a sub-frame, a base for said sub-frame, a rockable chair embodying a back, seat and frame mounted on said sub-frame, means on said base sloping downwardly at the forward end on which said sub-frame is supported for forward and downward movement, a pair of links having the adjacent ends pivoted together, means for pivoting one end of one link to the base and the other end of the other link to said sub-frame in a manner to permit them to move into aligned locking relation one above and in extension of each other for locking the chair in rearward and forward

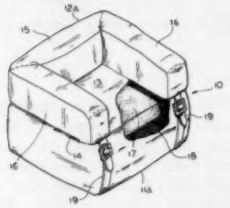
positions, and means actuated when the sub-frame is locked at the forward and rearward positions for deflecting the two links out of alignment when disposed one above the other and in extension of each other for releasing said lock in both positions.

4,179,158

MODULAR BEAN BAG SEATING DEVICES

Dennis M. Flaum, 1 E. Schiller, Chicago, Ill. 60610, and H. Lawrence Fleishman, 6518 N. Kenton, Lincolnwood, Ill. 60645

Filed Dec. 19, 1977, Ser. No. 861,830
Int. Cl.[2] A47C *13/00, 15/00*
U.S. Cl. 297—118 **4 Claims**



1. A modular furniture construction, comprising:

at least one pedestal formed from a plurality of panels including an upper, horizontal seating surface, a lower horizontal bottom, a front, a back and a plurality of sides;

at least one cushion,

each said pedestal and each said cushion at least partially stuffed with a filling material allowing each said pedestal and each said cushion to substantially maintain their respective shapes when force is exerted thereon; and

means for firmly and detachably securing selected of said cushions to selected of said pedestals with a bottom of each said cushion resting atop each said pedestal, and for firmly and detachably securing selected of said pedestals one to the other,

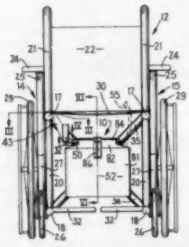
said securing means including means positioned horizontally on each said pedestal about the periphery of each said pedestal where said seating surface meets said back and said sides, and characterized by being horizontally slidably engagable to enable lateral attachment of selected of said pedestals one to the other as well as enabling vertical attachment of selected of said cushions to selected of said pedestals.

4,179,159

URINARY DRAINAGE BAG SUPPORT

James F. Sieklucki, 1510 Spruce Dr., Kalamazoo, Mich. 49008, and Ralph Veld, Jr., Kalamazoo, Mich., assignors to James F. Sieklucki, Kalamazoo, Mich.

Filed Mar. 13, 1978, Ser. No. 886,068
Int. Cl.[2] A47C *7/62;* **A61F** *5/44*
U.S. Cl. 297—192 **12 Claims**



1. In combination with a conventional wheelchair of the kind having a transversely collapsible seat, spaced opposed side frames including opposed side rail members and connected for transverse movement toward and away from each other between a full width use position, for supporting a person on said chair, and a reduced width nonuse position, said chair having a seat, a said rail member extending longitudinally adjacent one side of said seat and being accessible from below said seat, a urinary drainage bag support, comprising:

a bracket fixed to said rail member and extending in transversely cantilevered relation therefrom beneath said seat;

an arm extending substantially horizontally from said bracket and pivoted thereon for movement from a transversely extending use position to a longitudinal stowed position substantially parallel to said rail member;

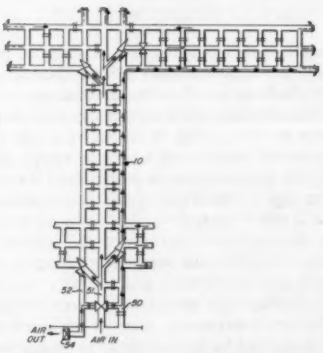
an envelope, for receiving a urinary drainage bag therein, supported on said arm and pivotable therewith between said use and stowed positions, said arm in its use position extending transversely between said side frames and supporting said envelope in forward facing orientation beneath said seat, said stowed position of said arm being angled rearward through about a right angle from said use position of said arm.

4,179,160

MINE LIFE LINE SYSTEM

Robert C. Sabo, Rte. 2, Box 159-2, Fairmount, W. Va. 26554

Filed Sep. 26, 1977, Ser. No. 836,329
Int. Cl.[2] E21F *11/00;* **E04H** *17/04, 17/20;* **E06C** *9/00*
U.S. Cl. 299—12 **6 Claims**



1. A life line system for use in the designated escape way of a mine comprising:

a spring loaded support compressable between a maximum extended length and a minimum compressed length;

a line holder supported from said spring loaded support;

a life line supported between a plurality of said spring loaded supports and extending along said designated escape way; and,

a plurality of enlargements formed on said life line, each enlargement having a gradual slope to said line on one side providing little resistance when a hand is slid along said line in a direction along said designated escape way and having an abrupt slope to said line on the other side providing a substantially higher resistance when a hand is slid along said life line in a direction opposite said designated escape way.

4,179,161

PLOUGH FOR WINNING MATERIAL FROM A MINERAL FACE

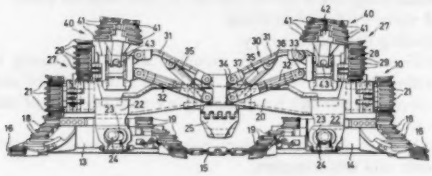
Oswald Breuer, Dortmund-Husen, and Bernd Steinkuhl, Lunen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Mar. 6, 1978, Ser. No. 883,931

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709392

Int. Cl.[2] E21C *27/34*

U.S. Cl. 299—34 35 Claims



1. A plough for winning material from a mineral face, wherein the plough includes two plough bodies connected together in a tension-proof manner, a beam connected to the two plough bodies at a pre-determined height, and linkage means to vertically pivot at least one plough upper part with respect to the beam, said plough further comprising:

(a) guide means for supporting each plough upper part on the beam,

(b) said guide means including a substantially vertical guide flange and a mating slot for receiving each said guide flange,

(c) each said vertical guide flange being located on a corresponding plough upper part, and

(d) each said mating slot being formed in the beam.

4,179,162

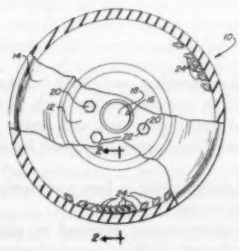
DYNAMIC WHEEL BALANCING SYSTEM

Dominic A. Zarlengo, 3025 W. Scott Pl., Denver, Colo. 80211

Filed Nov. 25, 1977, Ser. No. 854,594

Int. Cl.[2] B60B *13/00*

U.S. Cl. 301—5 BA 2 Claims



1. In a system for balancing a wheel-tire assembly wherein the assembly includes a wheel upon which a tire is mounted, the improvement comprising a plurality of separate independently movable mass means positioned within said tire, said mass means having a generally cylindrical configuration defining a cylindrical wall, with the ends of the cylinder lying in planes which are oblique to the longitudinal axis of the cylinder such that the mass means can roll along their cylindrical wall until a balanced condition of the assembly is attained and will then seat on one of said ends to inhibit further movement of the mass means upon a change in rotational speed of the assembly.

4,179,163

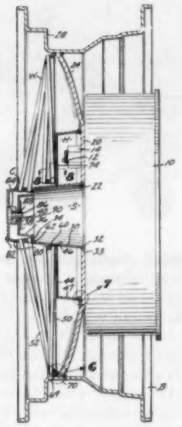
SIMULATED WIRE SPOKE WHEEL ASSEMBLY

Raymond C. Brown, Tarzana, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Continuation of Ser. No. 875,444, Feb. 6, 1978, abandoned. This application Nov. 27, 1978, Ser. No. 963,952

Int. Cl.[2] B60B *7/04*

U.S. Cl. 301—37 SS 7 Claims



1. A simulated wire spoke wheel assembly for use with a wheel body having a centrally apertured bolt-on flange that merges into an attachment flange to the radially outer end of which is affixed a tire rim, with the bolt-on flange receiving lug bolts to be engaged by lug nuts, said assembly comprising:

an outwardly extending spider cup having means at its inner end coaxially removably seated within the central aperture of the bolt-on flange so as to be locked against outward movement relative to said bolt-on flange, the outer end of said spider cup having an end wall;

a hub cup telescopically slidably supported upon said spider cup, said hub cup including an open inner end resting against the outer surface of said bolt-on flange radially outwardly of the lug bolt area thereof so as to protectively cover the lug bolts and lug nuts disposed within such lug bolt area;

a wire spoke basket having a row of inner spokes and a row of outer spokes that slope radially rearwardly and inwardly relative to the axis of rotation of the wheel body, the radially inner ends of said outer spokes terminating adjacent the outer end of said spider cup;

inner and outer support rings affixed respectively to the radially inner ends of said inner and outer rows of spokes, said rings being telescopically received by said spider cup;

peripheral support ring means affixed to the radially outer ends of said inner and outer rows of spokes and engaging said wheel body adjacent the intersection of said attachment flange and said tire rim;

a cap coaxial with and telescopically encompassing the end wall of said spider cup; and

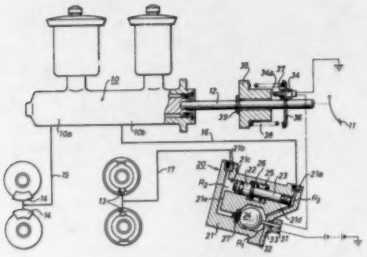
attachment means interposed between said cap and the end wall of said spider cup which when engaged draw said cap and said spider cup together and urge said wire spoke basket inwardly against said hub cup.

4,179,164

BRAKING PRESSURE CONTROL VALVE UNIT

Hiromu Konishi, Toyota, and Kiyoshi Nishiwaki, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 7, 1978, Ser. No. 913,434
Claims priority, application Japan, Jul. 26, 1977, 52-89585
Int. Cl.[2] B60T *8/14, 8/26*
U.S. Cl. 303—24 F **3 Claims**



1. In a fluid pressure control device for a vehicle braking system incorporating between a master cylinder and rear wheel brake cylinders, said master cylinder being operated by a push-rod of a brake pedal, which control device comprises a housing adapted to be mounted on a vehicle body frame, said housing being provided thereon with an inlet port for connection to said master cylinder and an outlet port for connection to said rear wheel brake cylinders and provided therein with a valve chamber in communication with said inlet and outlet ports; a valve seat provided within said valve chamber to permit fluid flow therethrough; and an inertia-controlled ball disposed within said valve chamber for normally permitting fluid communication between said inlet and outlet ports through said valve seat but adapted to co-operate with said valve seat to cut-off the fluid communication when said ball is subjected to a deceleration in excess of a predetermined value; the improvement comprising:

solenoid means having a solenoid winding attached to said housing and a plunger extending through said solenoid winding into said valve chamber and located behind said ball, said plunger being moved forwardly by energization of said solenoid winding to engage said ball against said valve seat;

a normally open switch means attached to a portion of said push-rod for connecting said solenoid winding to a source of electricity when closed; and

a movable element slidable on said push-rod to be displaced toward said switch means by inertia force acting thereon when said brake pedal is rapidly depressed, said movable element closing said switch means when engaged with said switch means.

4,179,165

MODULATING VALVE ASSEMBLY FOR RAILROAD CAR BRAKE CYLINDERS

William R. Page, 400 E. Randolph St., Chicago, Ill. 60601, and James G. Rees, 1212 Lake Shore Dr., Chicago, Ill. 60610

Continuation-in-part of Ser. No. 813,005, Jul. 5, 1977, Pat. No. 4,093,315. This application May 30, 1978, Ser. No. 910,687
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.[2] B60T *11/12*
U.S. Cl. 303—59 **14 Claims**

1. In railroad car air brake equipment including a brake cylinder pipe connected to the brake cylinder head for communicating fluid under pressure to the brake cylinder from the outlet of the brake cylinder pipe to the inlet of the brake cylinder head, a modulating valve assembly therefor for supplying the braking pressure fluid to the brake cylinder at a pressure that is a predetermined percentage of the pressure fluid in the brake cylinder pipe for brake service strokes above minimum service applications, said assembly comprising:

a bracket plate connected in the brake cylinder pipe to define the brake cylinder pipe into upstream and downstream sections on either side of same with regard to the direction of fluid flow through the brake cylinder pipe on brake service strokes of the equipment,

said bracket plate being formed to define a first passage communicating with the brake cylinder pipe upstream section and a second passage communicating with the brake cylinder pipe downstream section,

a modulating valve device carried by said bracket plate,

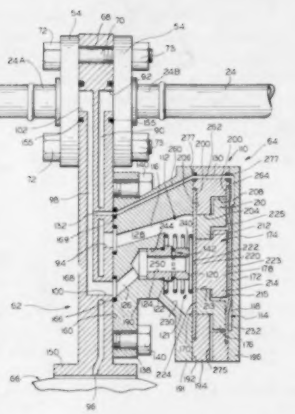
said valve device comprising:

a housing defining a cavity,

a differential valve member mounted across said cavity to define first and second chambers on either side of said valve member and for flexing movement laterally of said valve member,

said bracket plate first passage being in free communication with said first chamber,

an annular valve seat positioned in said first chamber adjacent said valve member, with said bracket plate second passage being in communication with said first chamber through said valve seat, and said valve member being mounted to be flexed against said seat for sealing off communication,



said second chamber being in free communication with said bracket plate second passage,

said valve member having exposed in said chambers on either side of same working areas of which the working area exposed to said second chamber is greater than the working area of same that is exposed to said first chamber by a predetermined ratio, whereby when said chambers are subject to fluid pressure in said passages, said valve member will be subject to a differential pressure force biasing same toward said seat,

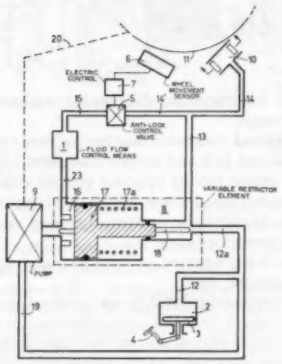
means for spring biasing said valve member away from said seat that is overcome when said differential force reaches a predetermined amount,

and check valve means in shunting relation to said seat for releasing fluid under pressure in said brake cylinder and second passage to said first passage when said brake cylinder pipe is free of the fluid under pressure.

4,179,166
ANTI-LOCK VEHICLE BRAKE SYSTEM WITH VARIABLE DECAY RATE

Denis Sharp, and Derek R. Skoyles, both of East Grinstead, England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 421,511, Dec. 4, 1973, abandoned, which is a continuation of Ser. No. 154,487, Jun. 18, 1971, abandoned. This application May 10, 1976, Ser. No. 684,800
Claims priority, application United Kingdom, Jun. 26, 1970, 31129/70; May 12, 1971, 31129/71
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—119 1 Claim

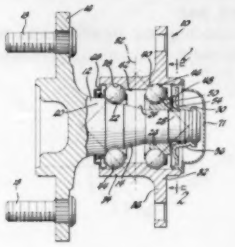


1. An anti-lock vehicle brake system for an associated vehicle having a plurality of wheels comprising: a source of fluid pressure, a wheel brake cooperating with at least one of said wheels, a first fluid conduit interconnecting said source of fluid pressure and said brake, an anti-lock control valve coupled to said first fluid conduit to relieve brake pressure when opened, sensing and control means connected to said control valve for detecting when one of said associated wheels tends to lock, said control valve opening responsive to said sensing and control means to allow fluid flow from said brake to relieve braking pressure therein, restricting means in said first fluid conduit for selectively restricting fluid flow to said brake from said source of fluid pressure, a second fluid conduit coupling said control valve to said restricting means, said restricting means being responsive to fluid flow from said brake through said control valve for restricting fluid flow from said source of fluid pressure to said brake to reduce fluid pressure delivered to said brake, and means connected in series with said control valve between said brake and said restricting means for controlling fluid flow through said control valve to said restricting means to a limited rate after an initial surge of fluid flow at a rate higher than said limited rate only during pressure values in said brake greater than a predetermined value to limit the rate of change of pressure in said brake, said means connected in series comprising a piston member, flow restricting means actuated by said piston member, spring means normally urging said piston member to a non-restricting position and pressure balancing means for balancing the fluid pressure on opposite sides of said piston.

4,179,167
ANTIFRICTION BEARING WITH MULTIPLE PIECE RACE

Loren E. Lura, Sandusky, and Philip B. Zeigler, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 789,829, Apr. 22, 1977, abandoned. This application Dec. 21, 1977, Ser. No. 862,948
Int. Cl.[2] F16C *33/30*
U.S. Cl. 308—189 A 4 Claims

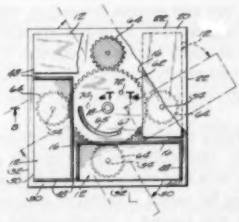


1. An antifriction bearing assembly comprising:
a first race having first raceway means,
circumferentially spaced antifriction element means engaging said first raceway means,
a second race comprising a first piece and a second piece, said first piece carrying a fixed angular contact raceway engaging said antifriction means for providing a thrust load acting on said first raceway means,
said second piece being carried by said first piece and having an angular contact raceway engaging said antifriction means for providing an opposing thrust load acting on said first raceway means,
said first piece having a circumferential groove receiving a plurality of hardened keeper ring parts which engage an end face of the second piece, said keeper ring parts being of a selected width to produce a desired end play or preload, and
an annular retainer ring having a portion which engages said keeper ring parts to retain said keeper ring parts in said groove and another portion which is permanently secured to said second piece.

4,179,168
DISPLAY DEVICE HAVING A LOCKING MECHANISM

L. Henry Isaac, Greendale; Edward J. Nowak, Cudahy, and Charles R. Schmitz, Muskego, all of Wis., assignors to Display Corporation International, Milwaukee, Wis.

Filed Jul. 12, 1978, Ser. No. 923,998
Int. Cl.[2] A47F *3/10*
U.S. Cl. 312—125 13 Claims



1. A display device including:
a plurality of generally vertical display racks forming a closed rectangular configuration having a plurality of

vertical sides, each of said display racks including a front face for supporting display items, a rear face and vertical end walls,

means for supporting each of said display racks for rotation between a first position wherein said front face of each of said display racks faces outwardly of said rectangular configuration for displaying the display items and wherein each of said vertical sides is formed by a front face of one of said display racks and an end wall of an adjacent display rack, and a second position wherein said front face of each of said display racks faces inwardly of said rectangular configuration, and

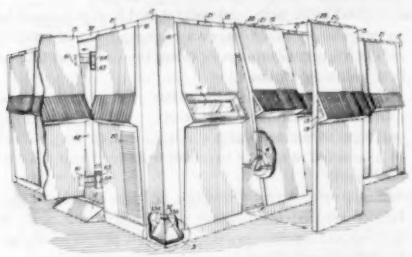
means for connecting the display racks for simultaneous shifting movement from said first position to said second position.

4,179,169

FACADE FOR A DATA PROCESSING SYSTEM

George R. Daniels, Phoenix, Ariz., and Helmut Henneberg, Canton, Mass., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 1, 1977, Ser. No. 856,362
Int. Cl.[2] A47B *43/00;* H02B *1/06*
U.S. Cl. 312—257 R **13 Claims**



1. A facade structure for enclosing data processing units comprising:

a superstructure having at least two walls being generally perpendicular, wherein each of said walls is comprised of unit sections and sections which are multiples of said unit sections, said superstructure walls being comprised of vertical and horizontal members,

a plurality of panels each including a release mechanism and capable of being detachably coupled to said super-structure, each of said panels having a dimension generally equivalent to said unit section dimension, wherein each of said panels is supported by a lower horizontal member and is coupled to an upper horizontal member by said release mechanisms, said panels being uncoupled from said superstructure by pressure applied to said release mechanisms; and

at least one entrance unit, said entrance unit including a one of said panels, said entrance unit having a first closed configuration with said entrance unit panel in a position in a plane formed by panels coupled to said superstructure;

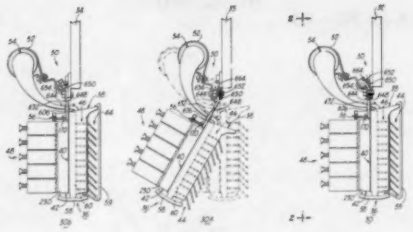
said entrance unit having a second closed configuration with said entrance unit panel in position in front of a plane formed by panels coupled to said superstructure, said entrance unit having an open configuration permitting access to an interior of said facade structure.

4,179,170

CONNECTOR ASSEMBLY FOR TELEPHONE DISTRIBUTION EQUIPMENT

Frank G. Splitt, Mt. Prospect; Casimir Cwirzen, Arlington Heights; William W. Hines, Arlington Heights, and Arnold M. Ladd, Arlington Heights, all of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Filed Mar. 13, 1978, Ser. No. 885,624
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 R **45 Claims**



1. A connector for telephone distributing equipment, said connector comprising:

a generally elongated connector base having first and second opposed faces and first and second elongated edges,

a ground plate means having opposed ground sides, one of said sides having conductive means, said ground plate means being adapted to be positioned against said second face of said connector base,

pedestal means being adapted to be positioned agaist said ground plate means, and

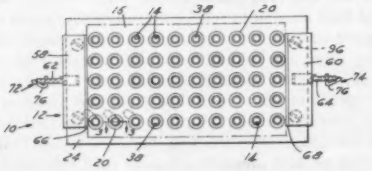
terminal means extending through said pedestal means, said ground plate means and said connector base to maintain said pedestal means against said ground plate means and to maintain said ground plate means against said second face of said connector base.

4,179,171

ELECTRICAL CONNECTOR

Shelly L. Shannon, 20 Timothy La., Battle Creek, Mich. 49017

Filed Mar. 3, 1978, Ser. No. 883,166
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—17 LC **12 Claims**



1. In an electrical connector adapted to mate with a terminal block of the type having a plurality of terminal contact blades upstanding therefrom and including a connector body adapted to be received over a said plurality of blades and means for making electrical contact with the contact blades, improved means for clamping said connector to a said terminal block comprising a pair of clamp members pivotally carried on opposite sides of said body, said clamp members having respective clamp heads adapted to embrace a said terminal block and clamp legs extending from said heads, a coil spring extending between said clamp members and normally resiliently biasing said clamp members such that said heads are in a retracted position, cam means carried centrally of said body in operative engagement with said clamp legs on a side of said body remote from the terminal block, and means for manually selectively rotating said cam means to pivot said clamp numbers including

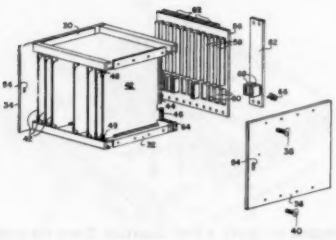
said heads from said retracted position to a position embracing a said terminal block, said clamp legs including respective leg portions extending in opposed lateral directions and being biased by said coil spring into operative engagement with said cam means.

4,179,172

MODULAR HARDWARE PACKAGING APPARATUS

Ernest E. Godsey; George W. Hoyle, and Rusty S. Christensen, all of Tucson, Ariz., assignors to Burr-Brown Research Corporation, Tucson, Ariz.

Filed Jun. 30, 1978, Ser. No. 920,671
Int. Cl.[2] H05K *1/07*
U.S. Cl. 339—17 LM **10 Claims**



1. Apparatus for electrically coupling modular electronic hardware to a digital system bus and to an industrial end device, said modular hardware including first and second groups of contacts, said apparatus comprising:

a motherboard electrically coupled to said bus and having at least one connector mounted thereon for engaging said first group of contacts from a first direction, said motherboard having at least one clearance hole therein; and

at least one termination assembly having at least one connector thereon which electrically couples said second group of contacts from said first direction and through said at least one clearance hole, said termination assembly comprising a printed circuit board having a conductor pattern thereon and at least one terminal block thereon for coupling to said end device, said conductor pattern connecting terminals of said terminal block to said at least one connector of said termination assembly.

4,179,173

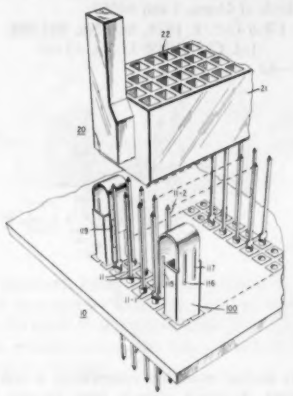
SHORTING CONTACT FOR USE WITH A MALE PIN BOARD

Samuel F. Rise, III, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 886,557, Mar. 14, 1978, abandoned.
This application Jan. 15, 1979, Ser. No. 3,103
Int. Cl.[2] H01R *33/54*
U.S. Cl. 339—19 **2 Claims**

1. Apparatus for forming electrical connections between leads and pins (**11**) extending from a board (**10**), said pins being adapted to receive a female connector (**20**), said connector having an insulating body (**21**) and being adapted to fit over said pins and being further adapted to connect to said leads, and characterized in that

said apparatus further comprises a free standing folded spring contact (**100**) for shorting pins and adapted for mounting on said board, said contact including a generally box-shaped base (**110**) for securing said contact to said board and for providing a structural strengthening of said contact, a strengthened (**116, 117**) cantilever leg (**115**) extending from said base through an inverted generally U-shaped, concave curvature (**120**) to a strengthened (**118, 119**) arm (**125**) of said spring, said curvature enclosing said base, said arm having a spoonlike, sperical contact surface (**140**) juxtaposed each pin to be shorted and being adapted to touch an area (**150**) of predetermined ones (**11-1, 11-2**)



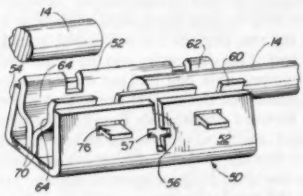
of said pins whereby an electrical short occurs between said predetermined pins.

4,179,174

JOINT CLIP ASSEMBLY FOR BUS BARS

George N. Jorgensen, Oxford, Ohio, assignor to Square D Company, Palatine, Ill.

Filed Oct. 16, 1978, Ser. No. 951,552
Int. Cl.[2] H01R *7/28*
U.S. Cl. 339—22 B **10 Claims**



1. A spring clip assembly for connecting a pair of longitudinally extending bus bars to each other with each bar carried in a respective housing, the improvement comprising;

an insulating member;

means for securing said insulating member in one of said housings;

a U-shaped metal spring member located between said insulating member and one bar carried in said one housing with said spring member extending beyond one end of said one bar;

respective integrally formed means on said insulating member and said spring for securing said spring to said insulating member,

a pair of metal clip members each engaged with a respective diametrically opposed portion of said one bar and engaged by said one bar against the legs of said spring member to hold said clip members and spring member engaged with said insulating member against movement transverse to the longitudinal axis of said one bar, said clip members extending beyond the one end of said one bar for receiving the other bar of said pair therebetween to electrically connect said bars; and

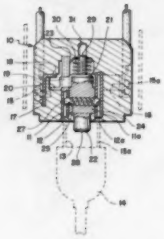
respective integrally formed means on said spring and clip members interlocking said clip members with said spring member and insulating member.

4,179,175

SAFETY SOCKET

Ivan A. Farnworth, 441 S. State, and Ivan R. Farnworth, 946 S. 500 East, both of Orem, Utah 84057

Filed Oct. 2, 1978, Ser. No. 947,995
Int. Cl.[2] H01R *13/44, 33/30*
U.S. Cl. 339—42 **7 Claims**



1. A safety socket assembly comprising a non-conductive housing having mounted therein two parallel conductive prong sheaths having facing apertures on the inside walls thereof and corresponding electrical terminals wherein one of said prong sheaths has mounted thereon a slidable contact and is electrically connectable to its corresponding terminal only by means of the slidable contact; a non-conductive, spring-loaded displaceable peg axially located in a peg cavity in the housing between the prong sheaths, said peg having a larger center portion extending transversely from one prong sheath to the other and having a transverse aperture therein, said peg also having a forward portion of reduced diameter which, when the peg is in its forward position, extends beyond the end of the prong sheaths, said peg also having a rear portion of reduced diameter attached to said slidable contact and containing means for keeping said peg in axial alignment; a peg spring surrounding the rear peg portion positioned in said peg cavity between the end of the peg cavity and the larger center portion of the peg; compressible peg locking means tensioned in the transverse aperture of the central portion of the peg locking the peg in a forward displaceable position; the prong sheaths, slidable contact, electrical terminals and displaceable peg being so positioned that the socket can be energized only when the prongs of an electrical plug are inserted into the prong sheaths compressing the peg locking means allowing the plug to displace the peg backwardly into the peg cavity thereby compressing the peg spring and moving the slidable contact backwardly on the prong sheath and into contact with its electrical terminal thereby energizing the socket until the plug is removed allowing the peg spring to move the peg and slidable contact forward de-energizing the socket and locking the peg in its forward position between the prong sheaths by the peg locking means.

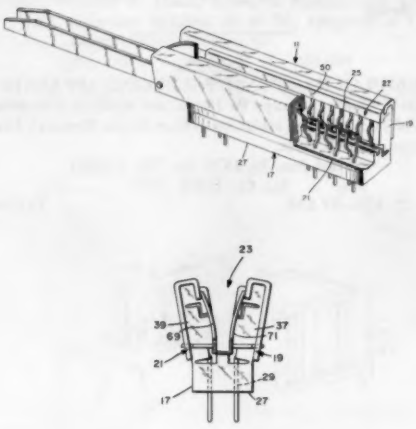
4,179,176

CIRCUIT BOARD CONNECTOR

Max L. Jayne, North Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 24, 1978, Ser. No. 909,136
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—74 R **16 Claims**

1. A low insertion force connector for making electrical contact beween a circuit board and an external circuit comprising a housing having two longitudinal and substantially parallel side walls forming a zone for receiving the circuit board, a plurality of the contacts mounted within said zone in spaced apart rows, said contacts having upper portions for contacting opposite sides of the circuit board and lower portions for making electrical contact with an external circuit, a camming means journaled for rotation about an axis substantially normal to said side walls and having camming surfaces engageable therewith so as to move said side walls apart when said camming means is actuated, said contacts being operably associated with respective sides of said housing for movement there-



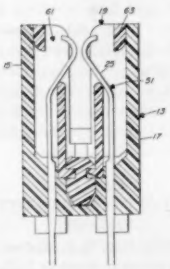
with and adapted to apply a low insertion force on said circuit board.

4,179,177

CIRCUIT BOARD CONNECTOR

Scott J. Lapraik, Pleasantville, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 23, 1978, Ser. No. 936,316
Int. Cl.[2] H01R *13/62;* **H05K** *1/07*
U.S. Cl. 339—74 R **10 Claims**



1. A low insertion force connector for making electrical connection between a circuit board and an external circuit comprising an elongated outer housing having a centrally located opening with a channel extending longitudinally along the bottom thereof, said channel including a plurality of outwardly facing ramps along the length thereof, a plurality of contacts mounted on said housing on either side of said channel, said contacts having end portions interior said opening and bowed inwardly for contacting a circuit board and opposite end portions projecting exterior of said outer housing for making electrical contact with an external circuit, an elongated cam having a longitudinal groove on either side thereof and a bottom surface configured to mate with said ramps and adapted to be actuated in a longitudinal direction for movement in a transverse direction, an inner housing interior said opening includes cam follower means projecting interior said grooves for providing positive engagement therewith and transverse movement corresponding to the transverse movement of said cam, said inner housing including a pair of upright

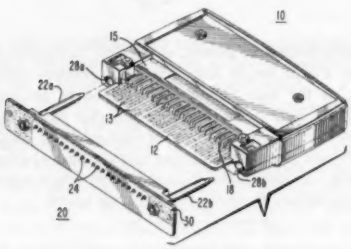
sections forming a zone for receiving the circuit board, each of said upright sections including means for abutting bowed portions on respective sides of said channel and being adapted to urge said bowed portions to a position disengaged from said circuit board when said cam is actuated.

4,179,178

PLUG-IN CIRCUIT CARTRIDGE WITH ELECTROSTATIC CHARGE PROTECTION

William J. Bachman, Mt. Laurel, and Franklin R. Dimeo, Woodbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 2, 1978, Ser. No. 874,636
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **5 Claims**



1. Cartridge apparatus, for use with a connector assembly including an actuator device, comprising:

a housing defining a receptacle for receiving said actuator device and an aperture, along a wall of said housing;

a rigid member secured within said housing;

an electrical circuit mounted on said rigid member, said electrical circuit including a plurality of mutually spaced conductive contact areas disposed along an edge of said rigid member and exposed through said aperture; and

a conductive member having an actuator contact region, and also including a plurality of mutually spaced conductive elements disposed along an edge of said conductive member and electrically connected in common to said actuator contact region, said conductive member being pivotally mounted within said housing for motion between (1) a first position in which (a) said conductive elements respectively conductively engage said contact areas, and (b) said actuator contact region is disposed within said receptacle in the path of travel of an actuator device to a seated position in said receptacle and (2) a second position in which said conductive elements are disengaged from said contact areas; said conductive member being subject to occupancy of said first position when said receptacle is unoccupied, and subject to displacement from said first position to said second position in response to displacement of said contact region from said path by an actuator device travelling to said seated position.

4,179,179

ELECTRICAL CONNECTOR HAVING MULTIPLE TERMINAL RECEPTACLE RECEIVING DIFFERENT PLUGS

Lawrence C. Lowden, Kansas City, Mo., assignor to Whitaker Cable Corporation, North Kansas City, Mo.

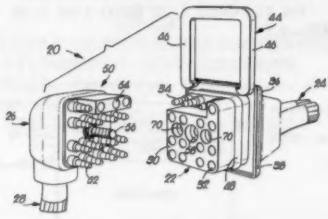
Filed May 17, 1978, Ser. No. 906,736
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—186 M **16 Claims**

1. In a multiple contact connector, a universal receptacle for mating with a plug assembly comprising either a single multiple terminal plug or various combinations of smaller plugs, said universal receptacle including:

a formed body;

a plurality of female connector terminals supported on said body; and

a number of male connector terminals carried on the body,



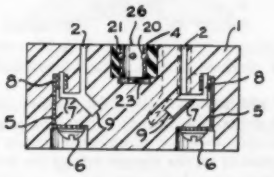
said male terminals being arranged relative to said female terminals in a manner to permit only one orientation and position for each of said plugs relative to said receptacle, whereby polarity across the connector is assured for all combinations of plugs.

4,179,180

SAFETY ELECTRICAL RECEPTACLE AND PLUG THEREFOR

Bobby W. Hanna, Box 174, Shiloh, Ga. 31826

Filed May 15, 1978, Ser. No. 905,723
Int. Cl.[2] H01R *33/46*
U.S. Cl. 339—189 R **4 Claims**



1. The interlocking electrical connector comprising:

(a) a base of electrical insulation material, said base having a front and back and intervening side walls, said base having at least one pair of arcuate slots in spaced relationship in the front of the base, each slot extending into the interior of the base in an interior extending segment and turning outwardly towards a side wall of the base to form an outwardly extending segment of the slot and then turning towards the front of the base to form a front extending segment, with an electrical contact lying adjacent to an end of the front extending segment of each slot, with the interior extending segment of each slot connected to a channel that extends further into the interior of the base in a direction to avoid being adjacent the electrical contacts at any point, with the opposite end of the slot connecting with an enlarged opening in the front of the base, and

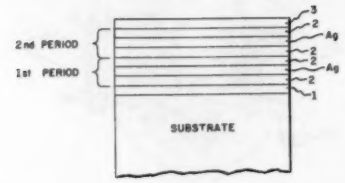
(b) a plug-in connector carrying spaced electrical contacts, with each contact having a shape corresponding to the shape of the slot in the base, with the contacts adapted to enter the enlarged openings in the front of the base and to be rotated into interlocking position with the electrical contacts in the base.

4,179,181

INFRARED REFLECTING ARTICLES

Leei Chang, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 3, 1978, Ser. No. 892,585
Int. Cl.[2] G02B *5/28;* **B05D** *5/06, 1/36*
U.S. Cl. 350—1.7 **15 Claims**



1. An interference-coated, infrared reflecting article comprising, in sequence,

(a) a substrate having a surface,

(b) a first layer of a refractory dielectric,

(c) a layer of silver having a thickness between about 110 and 250 A,

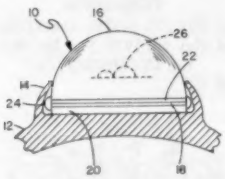
(d) a second layer of the refractory dielectric.

4,179,182

HOLOGRAPHIC JEWEL

Morris R. Smith, 1346 Caminito Septimo, Cardiff, Calif. 92007

Filed Oct. 28, 1977, Ser. No. 845,727
Int. Cl.[2] G03H *1/20, 1/24*
U.S. Cl. 350—3.69 **13 Claims**



1. A white light hologram jewel for jewelry, comprising:

(a) a second generation Lippmann-Bragg hologram having an orthoscopic image of an object recorded therein, said image appearing on the viewer side of the hologram, said second generation hologram being made by using a psuedoscopic image reconstructed from a first hologram as the object for making said second generation hologram;

(b) a thick lens discrete from said hologram, bonded to and covering the viewer side of said hologram;

(c) said lens providing optical leverage in that a small tilt of the jewel relative to a read-out incident light beam causes a large spectral shift enhancing color change and amplifying the optical illusion of the object turning about a point in the jewel.

4,179,183

DEVICE FOR SCANNING A LIGHT BEAM AT A CONSTANT SPEED

Masamichi Tateoka, Kawasaki, and Kazuo Minoura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1978, Ser. No. 902,401
Claims priority, application Japan, May 7, 1977, 52-52532
Int. Cl.[2] G02B *27/17, 9/10*
U.S. Cl. 350—6.1 **3 Claims**

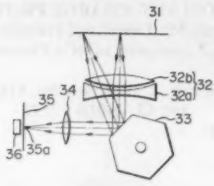
1. A light beam scanning device comprising:

(a) a light source section for generating a scanning beam;

(b) a deflector which receives the light beam from said light source section, and effects deflection of said light beam in a predetermined direction at a constant angular speed;

(c) a surface to be scanned by said light beam which has been deflected by said deflector; and

(d) a focussing lens for the scanning operation, said lens being disposed between said deflector and said scanning surface and being composed of a front single lens, having



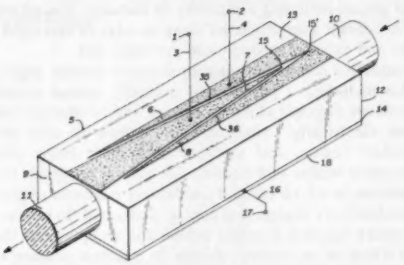
a negative refractive power, at the side facing the deflector and a rear single lens, having a positive reflective power, at the side facing said surface to be scanned, wherein the light beam from said deflector passes through said front single lens and then through said rear single lens and is focussed on said scanning surface, and wherein said focussing lens causes the focussed beam which scans said scanning surface to move at a constant speed.

4,179,184

ELECTROOPTICAL MODULATOR

Arthur R. Nelson, Troutville, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,651
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.14 **12 Claims**



1. Optical modulator apparatus comprising:

optically transparent plate means characterized by an electrically variable effective index of refraction,

optical input and output port means for establishing a path for the propagation of light through said plate means, and

a plurality of isolated electrode means for establishing variable electric fields through said plate means generally normal to said path for changing said effective index of refraction, thereby diverting corresponding portions of said light from said path and from said output port means,

said plurality of isolated electrode means including first and second mutually coplanar electrode means,

said first coplanar electrode means lying generally symmetrically at one side of said path and having a generally triangular shape,

said second coplanar electrode means lying generally symmetrically at said one side of said path and having an internal shape conformal with said generally triangular shape for forming first vee-shaped gap means between said first and second coplanar el :trode means, and

said plurality of isolated electrode means including cooper-

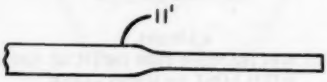
ating electrode means spaced from said first and second coplanar electrode means at a second side of said path.

4,179,185

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Robert M. Hawk, Bath, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,623
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.16 8 Claims



1. An optical signal coupler comprising a plurality of optical waveguide filaments each having a core of transparent material having a refractive index n_1 surrounded by a layer of transparent cladding material having a refractive index n_2 that is lower than n_1, the end portions of which are disposed in fused, side-by-side relation to form a unitary, multi-cored structure wherein the space between adjacent cores is occupied by only said cladding material, the cross-sectional shape of said multi-cored structure being substantially circular, the end of said multi-cored structure opposite that from which said filaments extend being planar and being substantially perpendicular to the axes of said cores at said end,

means disposed on said end for reflecting light, the wavelength of which is to be transmitted by said optical waveguide filaments, and

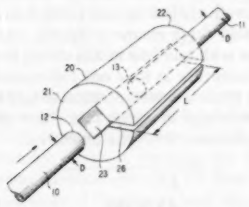
means in addition to the fusing together of said fibers for enhancing optical signal cross-talk among the cores of said multi-cored structure.

4,179,186

APPARATUS AND METHOD OF SPLICING OPTICAL FIBERS

Arthur R. Tynes, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1978, Ser. No. 892,275
Int. Cl.[2] G02B 5/14; B65H 69/02
U.S. Cl. 350—96.21 8 Claims



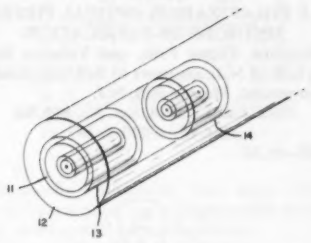
1. A coupler for splicing one or more pairs of optical fibers (10, 11) end to end, comprising a sleeve (20) having at least one fiber holding channel (23) extending longitudinally therethrough, each holding channel having at least one V-shaped groove of sufficient size so that the circumference of the optical fibers is capable of tangentially contacting each side (24, 25) of the groove CHARACTERIZED IN THAT said sleeve further includes a first slot (26) beginning at the outer periphery of said sleeve and extending into each holding channel, said slot having a small width (W) that is less than the diameter (D) of the fibers to be spliced, said sleeve being collapsed about said fibers as a result of the application of a predetermined elevated temperature in combination with a predetermined elevated pressure, said temperature serving to soften the sleeve material to permit the controlled collapse of said sleeve under said elevated pressure, said collapsed sleeve retaining said fibers in precise alignment by insuring that all fibers tangentially contact each side of said groove.

4,179,187

MULTIPLE MODE WAVEGUIDE HAVING CYLINDRICAL PERTURBATIONS

Robert D. Maurer, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,152
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.30 2 Claims



1. A multiple mode waveguide comprising:

a glass core,

a glass cladding around said core, said core having a higher index of refraction than said cladding, and

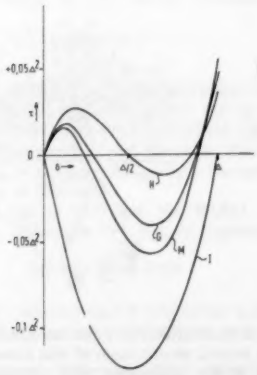
cylindrical perturbations in said core having a different index of refraction than the unperturbed core between the ends of said cylindrical perturbations, said perturbations being spaced along the axial length of said core, each of said perturbations including index of refraction variations in concentric rings within said core.

4,179,188

GRADIENT OPTICAL FIBER

Siegfried Geckeler, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 3, 1978, Ser. No. 921,495
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2732444
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.31 2 Claims



1. A gradient optical fiber with an optimized index of refraction profile with the improvement being a normalized difference in the index of refraction Δ being in a range of 0.005 to 0.011, with $-(k_0/\Delta \cdot d\Delta/dk_0)$ being in a range of 0.09 to 0.11, an

index of refraction profile function f(r/a) according to a formula of

$$f(r/a)=(r/a)^{\alpha}+A((r/a)^{\alpha}-(r/a)^{2\alpha})$$

and a profile dispersion function F_N according to

$$F_N=f^{g},$$

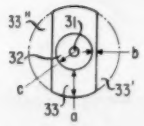
wherein α being in a range of 2.013 to 2.015, A being in a range of 0.114 to 0.116 and g being in a range of 2.4 to 2.6.

4,179,189

SINGLE POLARIZATION OPTICAL FIBERS AND METHODS OF FABRICATION

Ivan P. Kaminow, Tinton Falls, and Vellayan Ramaswamy, Lincroft, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 13, 1978, Ser. No. 869,366
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.33 **7 Claims**



1. A single polarization optical waveguide at least partially surrounded by an outer jacket having a different thermal expansion coefficient than said waveguide, and a thickness a along one direction that is different than its thickness b along a direction orthogonal to said one direction;

characterized in that:

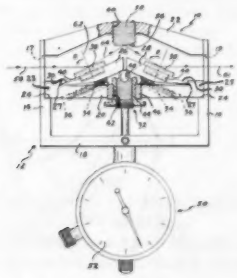
the ratio of b to a is equal to or less than 0.1; and in that the induced strain birefringence Δn of the waveguide is greater than 5×10^{-5}.

4,179,190

WIDE BAND ADJUSTABLE BREWSTER ANGLE POLARIZER

Jerome D. Friedman, and Carl A. Pitha, both of Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 3, 1978, Ser. No. 866,742
Int. Cl.[2] G02B *5/30*
U.S. Cl. 350—152 **8 Claims**



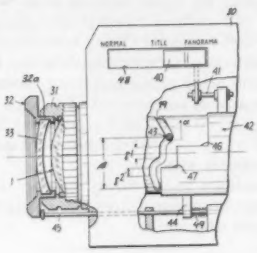
1. A wide band adjustable polarizer comprising a housing, a first and a second mount, each of said mounts being movably connected in the knife-edge type relationship at one end thereof to said housing, a dielectric element being secured to said first mount, another dielectric element being secured to said second mount, each of said dielectric elements being made of a material capable of transmitting light in both the visible and infrared range of the optical spectrum means operably connected to said housing and optically interposed between said pair of dielectric elements for directing a reflected beam of light from one of said dielectric elements to the other of said dielectric elements, and means operably connected to said first and second mounts for equally displacing said first and second mounts a preselected distance whereby upon proper adjustment of said first and second mounts the angle between the normal to said dielectric element and an incoming light beam is established at the Brewster angle thereby producing a reflected beam of light from said dielectric element which is polarized.

4,179,191

ADJUSTING MECHANISM FOR OPTICAL OBJECTIVE WITH LOST-MOTION ZONE

Otto Freudenschuss; Eduard Keznickl, and Gottfried Patels, all of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 14, 1977, Ser. No. 851,353
Claims priority, application Austria, Nov. 15, 1976, 8469/76
Int. Cl.[2] G02B *7/10, 15/14, 15/10*
U.S. Cl. 350—187 **14 Claims**



1. An optical system comprising:

a varifocal objective including lens means axially shiftable over a predetermined range of displacement including a first subrange for varying the focal length of the objective and a second subrange for varying the position of an object plane thereof;

control means adjustable over a predetermined operating range corresponding to said range of displacement; and

drive means operatively linking said control means with said lens means, said drive means positively connecting said control means with said lens means throughout said operating range except for at least one lost-motion zone coinciding with a predetermined position of said lens means in said second subrange in which said object plane lies at a certain close distance from the objective.

4,179,192

LASER FUSION OPTICAL SYSTEM

David R. Shafer, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 695,370, Jun. 14, 1976, abandoned. This application Aug. 18, 1977, Ser. No. 825,662
Int. Cl.[2] G02B *5/10*
U.S. Cl. 350—294 **2 Claims**

1. A laser optical system comprising, in combination, a pair of concave mirrors having substantially the same radius and the same surface figure,

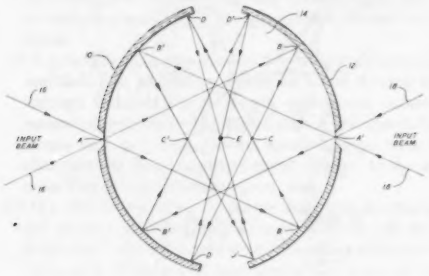
said mirrors being disposed in opposed relationship to form a mirror cavity therebetween,

a laser target centrally disposed in said cavity,

means for directing a laser beam into said mirror cavity,

said mirrors being spaced apart one with respect to the other and contoured so that said beam enters the mirror cavity

and reflects off one mirror, which focuses the light at a point located in said cavity, from which it diverges and



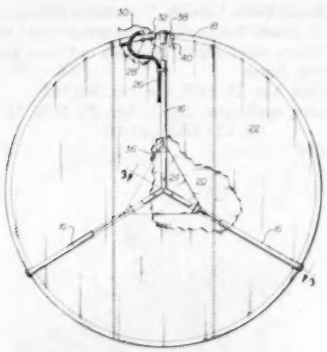
fills the other mirror, and the other mirror focuses it at said target to thereby heat said target.

4,179,193

FOCUSING REFLECTOR

Roger B. Gillette, Auburn, and Weightstill W. Woods, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 10, 1978, Ser. No. 894,819
Int. Cl.[2] G02B *5/10*
U.S. Cl. 350—295 **7 Claims**



1. A focusing mirror comprising:

a rigid exterior closed frame member defining a substantially planar surface on both the front and the back,

gas impermeable members covering the front and the back of the frame member, spanning the distance defined by the frame and secured thereto, at least one of which gas impermeable members is flexible and has a reflective coating upon its exterior surface,

capacitive sensor means electrically isolated from the reflective membrane, mounted by a suspension system within the frame and between the gas impermeable members,

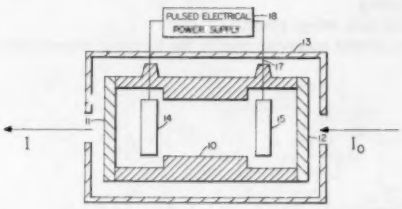
means for controlling the pressure between the gas impermeable members relative to the ambient pressure said means responsive to a variance in capacitance between the capacitive sensor means and the coated membrane caused by a varying distance between the capacitive sensor means and the reflective membrane and by varying the relative pressure adjusting the curvature of the reflective membrane and controlling the focus whereby a predetermined focus is maintained even though the orientation of the mirror is altered or the ambient pressure changes.

4,179,194

ELECTRICALLY CONTROLLABLE WIDE ANGLE OF VIEW OPTICAL NOTCH FILTER

Myer Geller; Daniel E. Altman, and Glidden J. Barstow, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1976, Ser. No. 654,124
Int. Cl.[2] G02F *1/17*
U.S. Cl. 350—356 **10 Claims**



1. An electrically controllable, wide angle field of view, notch filter for attenuating narrow bandwidth wavelengths of light energy in an optical path comprising:

an enclosure containing a selected material,

said material being characterized by exhibiting strong quantum mechanical coupling between two determinable energy states of different levels above its ground energy state, and producing radiated emission within said narrow bandwidth wavelengths when externally excited to populate the upper of said two determinable energy states;

means for maintaining said enclosure at a temperature to vaporize the selected material;

windows supported at opposite ends of said enclosure in alignment with said optical path,

said windows being substantially transparent to the light energy propagated in said optical path;

first and second electrodes oppositely positioned within said enclosure contiguous to said optical path and having external terminals for connection to a source of electrical energy;

a source of pulsed electrical energy controllably connectable to said electrodes for generating an electric current discharge thereacross within said enclosure,

said electric current discharge being of sufficient strength to raise the vaporized selected material from its ground energy state to the lower of said two determinable energy states, causing selective absorption of said narrow bandwidth wavelengths of light energy propagated in said optical path.

4,179,195

METHOD AND APPARATUS FOR DETERMINING THE STRABISMUS ANGLE BETWEEN THE OPTICAL AXES OF A FIXING AND A STRABISMIC EYE

Jörg Krumeich, Wattenscheid, and Hermann Rössler, Essen, both of Fed. Rep. of Germany, assignors to Hermann Rössler, Essen, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,063
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616870
Int. Cl.[2] A61B *3/08*
U.S. Cl. 351—4 **12 Claims**

1. A method for determining the strabismus angle between the optical axes of a fixing and of a strabismic eye, comprising the steps of

adjusting the spacing of the centers of two light sources from one another to the pupillary distance of the fixing and of the strabismus eye respectively,

adjusting the spacing of parallel optical axes of two optical receiving devices from one another with the optical axes

remaining parallel to one another to a distance corresponding to the pupillary distance,

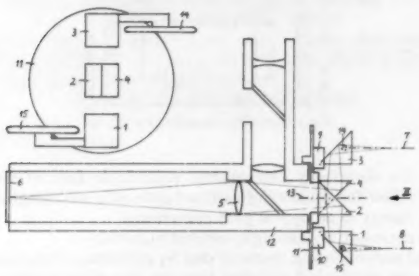
illuminating each eye from said two light sources, respectively, and producing a light reflection on the corneas of the eyes, and

imaging the pupils of both eyes and both of the light reflections on the corneas of both eyes on one common image plane via the two optical receiving devices.

5. An apparatus for determining the strabismus angle between the optical axes of a fixing eye and a strabismic eye, comprising

a common image plane,

two optical receiving means for imaging respectively one



eye each by one of said receiving means onto said common image plane, said receiving means each defining an optical axis and being aligned axially parallel with said optical axes,

two light source means, each for respectively illuminating one of the eyes, are coordinated to said two optical receiving means, respectively, and

said two optical receiving means and said two light source means are mounted transversely displaceable to the direction of the optical axes of said receiving means for changing the respective spacing of the centers of the two light source means as well as the spacing of the optical axes of said two optical receiving means relative to one other corresponding to the pupillary distance of the eyes.

4,179,196

COMPACT SUBJECTIVE REFRACTIVE INSTRUMENT

Staffan B. Persson, Danielson, Conn., and Robert B. Tackaberry, Williamsville, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sep. 30, 1977, Ser. No. 838,178

Int. Cl.[2] A61B *3/02*

U.S. Cl. 351—30 **8 Claims**

1. A subjective refractor for determining lens values required to correct visual deficiencies of an eye which comprises,

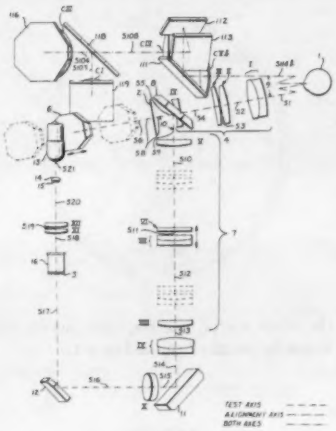
a target, means to project an image of said target to a normal image plane on a test axis,

first reflection means to axially move said target image to either side of said normal image plane,

second and third reflection means to fold the test axis,

an axially-rotatable cylinder means to axially move one meridian of said target image to either side of said image, said cylinder means being located between said second and third reflection means, and

an eyepiece having a front focal plane located at a position up to 4 mm from said normal image plane



whereby any single exterior dimension of said instrument is substantially less than the test axis distance between said target and said eyepiece.

4,179,197

SOUND MOTION PICTURE PROJECTION SYSTEM

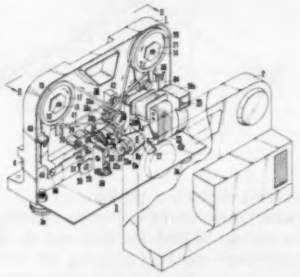
Kuniyoshi Suzuki, Machida; Akira Ashida, Yokohama; Takashi Itani, Yokohama; Tateo Yamada, Yokohama; Masaya Maeda, Kawasaki; Kiyoshi Takahashi, Kunitachi, and Hiroyuki Takimoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,762

Claims priority, application Japan, Apr. 27, 1976, 51/48289

Int. Cl.[2] G03B *31/00*

U.S. Cl. 352—14 **5 Claims**



1. A sound motion picture projection system comprising:

(A) a picture projection unit having;

(A-1) a driving motor,

(A-2) a first film advancing means for intermittently advancing film through a picture projection station, and

(A-3) a picture projecting means disposed adjacent to said picture projection station,

(B) a sound recording and reproducing unit attachable to said picture projection unit, having;

(B-1) a second film advancing means for continuously advancing the film through a sound recording and reproducing station,

(B-2) a sound recording and reproducing means disposed adjacent to said sound recording and reproducing station,

(B-3) a first connecting means for operatively connecting said second film advancing means with said driving mo-

tor, said first connecting means including first speed change means manually operable from outside the sound recording and reproducing unit for changing the film projection speed and the sound recording or reproduction speed,

(B-4) a second connecting means for operatively connecting said first film advancing means with said driving motor through said first change means, said second connecting means being operatively coupled to said first speed change means and including second speed change means for changing the film projection speed relative to the sound recording or reproduction speed, and

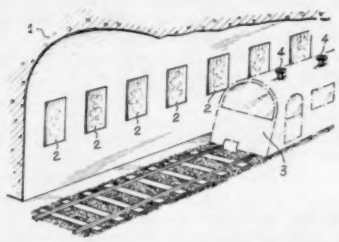
(B-5) a film loop sensing means for detecting the change in the amount of a film loop formed between said picture projection station and said sound recording and reproducing station, wherein said loop sensing means has an output member, which is applied to said second speed change means to change the film projection speed according to the change in the size of the film loop amount by adjusting the second speed change means.

4,179,198

INSTALLATION FOR THE ANIMATION OF PICTURES

Roland F. C. Brachet, Domaine d'Arnaga, 83810 Callian, and Pierre M. Boismard, 10, rue de Castellane, 75008 Paris, both of France

Filed Mar. 27, 1978, Ser. No. 890,689
Claims priority, application France, Mar. 25, 1977, 77 09086
Int. Cl.[2] G03B *25/00*
U.S. Cl. 352—100 **1 Claim**



1. An installation for the animation for pictures for transportation systems such as railway systems and the like wherein a passenger vehicle moves along a path with respect to a generally parallel tunnel wall, said installation comprising:

a series of stationary pictures mounted along the path of travel of the passenger vehicle, said pictures being spaced apart by a predetermined interval;

a plurality of light emitting devices mounted on the vehicle in spacially displaced locations along the length of the vehicle;

normally inoperative means for simultaneously actuating all of said light emitting devices; and

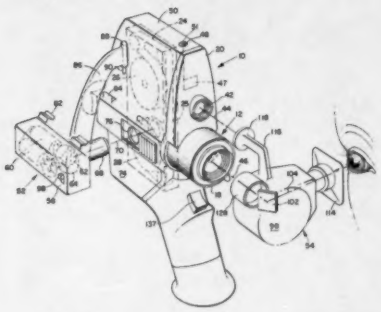
control means for periodically operating said actuating means, said control means being responsive to the motion of the vehicle to cause actuation of said light emitting devices when the vehicle has travelled a distance equal to the predetermined interval between the stationary pictures whereby each time said actuating means is operated a plurality of stationary pictures spanning a distance commensurate with the length of the vehicle will be illuminated.

4,179,199

COMBINATION MOTION PICTURE CAMERA AND VIEWING APPARATUS

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1979, Ser. No. 506
Int. Cl.[2] G03B *19/18*
U.S. Cl. 352—138 **3 Claims**



1. Apparatus for permitting viewing of images carried by a motion picture film strip contained within a cassette of the type wherein projection illumination may be directed to the backside of the film strip by a reflecting prism mounted within the cassette behind the film plane at a projection station; said apparatus comprising a movie camera adapted to receive and operatively engage the cassette to effect movement of the film past said projection station, said camera including a taking lens having a lens axis passing through said projection station and operative in an exposure mode for recording scene images on unexposed film; said apparatus further comprising means for cooperating with said movie camera and the cassette for directing light into said reflecting prism to result in projection of the image carried by the frame of the film strip at the projection station along the lens axis of said camera; and said apparatus further comprising an optical viewing system for providing visual access along said lens axis of said camera for viewing of said images projected therealong, said optical viewing means comprising; an objective lens disposed along said lens axis to receive an aerial image formed by the camera's taking lens, a reflective element disposed along said lens axis outwardly from said objective lens to receive the image formed by said objective lens and to direct said image bearing light along a viewing axis substantially perpendicular to said lens axis, and, an eye piece element disposed along said viewing axis for focusing and viewing therethrough said image directed thereto by said reflective element.

4,179,200

SCREEN COATING SYSTEM FOR PANEL OF COLOR PICTURE TUBE

Akira Kotoyori, Ichinomiyamachi, Japan, assignor to Hitachi, Ltd., Japan

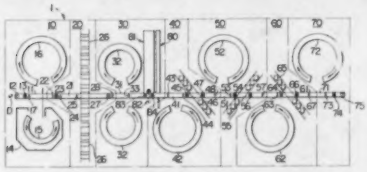
Filed Mar. 30, 1978, Ser. No. 891,624
Claims priority, application Japan, Apr. 4, 1977, 52-40920[U]
Int. Cl.[2] G03B *41/00*
U.S. Cl. 354—1 **5 Claims**

1. In a screen coating system for a panel comprising an automatic coating line including conveying line for conveying panels and dummy panels which serve to hold shadow masks and a plurality of panel coating stations and exposing stations provided along said conveying line the improvement comprising:

panel storage means disposed adjacent to the conveying line;

panel transfer means for transferring panels forwarded to a first position on said panel conveying line to said storage

means and for conversely transferring panels from said storage means to said first given position; and



ejecting means for sending to the outside of said conveying line panels and dummy panels forwarded to a second position downstream of said first position on said conveying line.

4,179,201

LENS STOP BRAKING IN AUTOMATIC EXPOSURE CAMERAS OF STOP VALUE CONTROL TYPE

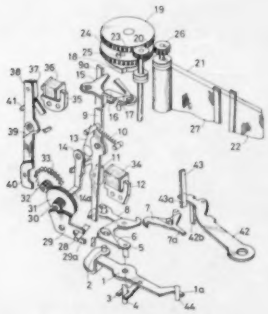
Hiroshi Kurei, Kawagoe; Masahiro Kawasaki, Tokyo, and Yukio Takaoka, Asaka, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 831,022

Claims priority, application Japan, Sep. 6, 1976, 51-106465; Sep. 7, 1976, 51-106912

Int. Cl.[2] G03B *7/08, 9/06*

U.S. Cl. 354—41 **9 Claims**



1. In an automatic exposure camera of the stop value control type wherein a suitable lens aperture diameter is obtained with respect to light reflected by an object, a preset shutter speed and film sensitivity, said automatic exposure camera having a lens stopping mechanism operated by a first magnet in response to measured variations in the object's light passed through the lens aperture to effect stop value control, the improvement comprising:

a brake magnet mechanism means having a second magnet for decelerating but not stopping the lens stopping mechanism, and

a control circuit responsive to the measured variations in the object's light passed through the lens aperture for controlling said second magnet of said brake magnet mechanism means.

4,179,202

DIAPHRAGM APERTURE CONTROL DEVICE IN A CAMERA

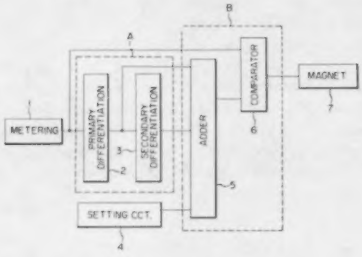
Toru Fukuhara, Isehara, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,117

Claims priority, application Japan, Sep. 29, 1977, 52-116156

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—43 **3 Claims**



1. An automatic diaphragm aperture control device used with a camera having an objective lens, a diaphragm having a diaphragm aperture, a shutter mechanism and a shutter speed selecting mechanism, said device including:

(1) means for stopping down the diaphragm from its open position prior to the commencement of exposure in association with a shutter releasing operation;

(2) light measuring means for measuring the light passing through the objective lens the diaphragm aperture and for producing an output signal indicative of such measurement;

(3) output means providing an output signal commensurate to a shutter speed selected by the shutter speed selecting mechanism;

(4) locking means for determining a diaphragm aperture by locking said means for stopping down the diaphragm so as to stop its stopping down operation;

(5) correction signal generating means putting out a primary differentiation signal resulting from the time-differentiation of the output signal of at least said light measuring means; and

(6) comparator means receiving as input the output signals from said light measuring means, said output means and said correction signal generating means and operating said locking means when said three signals assume a relationship providing a proper diaphragm aperture;

the improvement residing in that said correction signal generating means further puts out a secondary differentiation signal resulting from secondary time differentiation of the output signal of said light measuring means.

4,179,203

CAMERA EQUIPPED WITH DATA RECORDING DEVICE

Michio Hirohata, Kawasaki; Toyotosi Suzuki; Hideo Yokota, both of Tokyo; Mutsuhide Matsuda, Yokohama; Tetsuya Taguchi, Kawasaki, and Noriaki Sanada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1976, Ser. No. 742,581

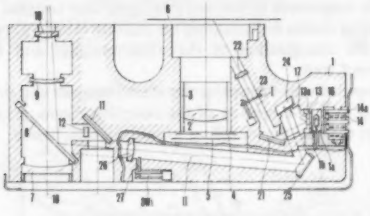
Claims priority, application Japan, Nov. 20, 1975, 50/139681; Mar. 19, 1976, 51/30491

Int. Cl.[2] G03B *17/24*

U.S. Cl. 354—106 **10 Claims**

1. A camera equipped with a data recording device comprising: a view finder, a data source having data marks required for denoting photographing data; a means for selecting and setting the data marks to be recorded; a light source for iliuminating the data marks arranged on the data source, means forming a first optical path for photographic insertion of data and a

second optical path for displaying data in the view finder, light blocking means movable into and out of the first optical path, the optical paths being disposed inside a camera body independently of each other in such a manner that data signal light which is transmitted through said data marks is guided separately to a photosensitive film and also to a view finder optical



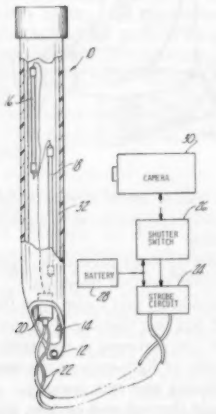
path, said blocking means causing the light to be transmitted along the two paths in different time stages; said data marks being directly visible along two directions; said photographic data insertion optical path and said data display optical path having at least portions extending along the respective directions and directly to the marks.

4,179,204

METHOD AND APPARATUS FOR PHOTOGRAPHING CHEMILUMINESCENT OBJECTS

Gregory A. Robinson, 3746 Hutchins Hill Dr., Orchard Lake, Mich. 48033

Filed Oct. 25, 1978, Ser. No. 954,706
Int. Cl.[2] F21V *9/16;* **G03B** *15/02, 15/03, 19/00*
U.S. Cl. 354—145 **4 Claims**



1. A method of photographing an object which is normally chemiluminescent having a hollow body of light transmitting material utilizing light produced internally of the object comprising the steps of:

removing an end of the body to empty out any chemiluminescent materials therein and to provide access to the interior of the body;

placing an electronic white flash light source within the body of the object;

placing a film of material around the source and within the body to conceal the source and to add color to the light output therefrom, and

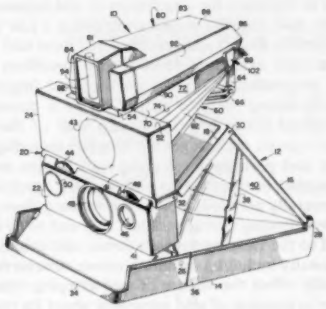
simultaneously momentarily energizing the source to produce a light flash and opening the shutter of a camera aimed at the object to photograph the light flash output and the object itself.

4,179,205

STROBE-LIGHT APPARATUS FOR USE WITH PHOTOGRAPHIC CAMERA

Fred M. Finnemore, North Reading, and Robert A. Goodwin, Braintree, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 8, 1978, Ser. No. 884,471
Int. Cl.[2] G03B *15/03*
U.S. Cl. 354—145 **2 Claims**



1. Photographic strobe-light apparatus for use with a camera of the type which includes a shutter-lens housing having a front wall behind which is mounted an automatic exposure control system and through which extends an objective-taking lens having an optical axis therethrough and a rearwardly extending top wall having a centrally disposed, downwardly extending, elongated flash socket which includes electrical contacts for providing an electrical signal from the automatic exposure control system to said apparatus during an exposure cycle of the camera, the camera additionally including a viewing device which includes an elongated cover of given width and a pair of spaced apart longitudinal side walls extending in a direction from the camera's front end to its rear end, said apparatus comprising:

an elongated housing including a front wall having an aperture therein, a rear wall spaced from said front wall, and a generally flat bottom wall extending between said front and rear walls;

a flash tube mounted within said elongated housing in predetermined alignment with said aperture of said front wall;

control means, responsive to the signal from the camera's automatic exposure control system, for energizing said flash tube;

an elongated, blade-like flash plug mounted adjacent said elongated housing's front wall and extending downwardly and generally perpendicular to said bottom wall of said elongated housing, said plug being structured to fit the camera's flash socket so that, when inserted into the flash socket, said flash plug and the flash socket, in combination, support the front end of said apparatus on the camera, said flash plug also having electrical contacts for mating with the electrical contacts of the flash socket to provide an electrically conducting path along which the signal from the camera's automatic exposure control system is transmitted to said apparatus's control means; and

means for releasably gripping the lower edges of the longitudinal side walls of the viewing device's cover, adjacent the rear end of the cover, to support the rear end of said apparatus adjacent the rear end of the viewing device's cover, said gripping means being located adjacent said rear wall of said elongated housing, depending downwardly from said elongated housing's bottom wall, and structured either to be initially slidably engaged with the cover's longitudinal side walls and then rotated with respect thereto so that said apparatus's rear end can be slid into engagement with the cover's rear end after which

said apparatus can be rotated with respect to its rear end to insert said flash plug into the flash socket to complete the attachment of said apparatus to the camera or alternatively to initially effect a snap-type connection about the lower edges of the cover's longitudinal side walls so that said apparatus's rear end can be engaged with the cover's longitudinal side walls by pushing said apparatus rear end against the cover in a direction generally perpendicular to the cover after which said apparatus can be rotated with respect to its rear end to insert said flash plug into the flash socket to complete the attachment of said apparatus to the camera, said gripping means comprising a pair of spaced apart flexible fingers each cantilevered from said housing's bottom wall, extending downwardly therefrom and generally perpendicular thereto, each of said fingers having inwardly-facing sections shaped to fit a corresponding longitudinal lower edge of a side wall of the viewing device's cover, each finger additionally including wedge-shaped end portions for forcing said fingers away from one another in response to pushing said apparatus's rear end generally perpendicular to the viewing device's cover thereby allowing said apparatus's rear end to be snap-connected to the viewing device's cover, said gripping means additionally including camming means structured to automatically effect the release of said gripping means in response to rotation of said apparatus about its rear end by first detaching said apparatus front end from the camera flash socket and then rotating the apparatus front end with respect to its rear end, said camming means comprising a pair of spaced-apart, opposed planar camming surfaces one each of which is formed in a corresponding one of said wedge-shaped end portions of said flexible fingers, each of said planar camming surfaces being disposed at an oblique angle with respect to a corresponding longitudinal side wall of the viewing device's cover to force said fingers away from one another in response to rotating said apparatus.

4,179,206

SINGLE LENS REFLEX CAMERA WITH ELECTROMECHANICALLY INITIATED DIAPHRAGM AND SHUTTER CONTROL

Nobuo Tezuka, Tokyo; Masanori Uchidoi, Kawasaki; Yukio Iura, Yokosuka; Satoshi Watanabe, Inagi; Masayoshi Yamamichi, Kawasaki, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

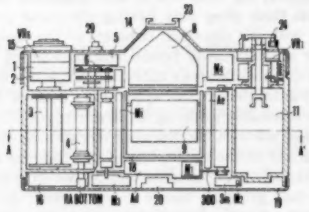
Continuation of Ser. No. 593,301, Jul. 7, 1975, Pat. No. 4,062,028. This application Apr. 26, 1977, Ser. No. 790,935

Claims priority, application Japan, Jul. 9, 1974, 49-78494; Jul. 9, 1974, 49-78495; Jul. 17, 1974, 49-83061; Jul. 17, 1974, 49-83062

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

Int. Cl.[2] G03B *19/12*

U.S. Cl. 354—152 **2 Claims**



1. A single lens reflex camera comprising:

a shutter device,

shutter driving means for driving the shutter device,

a mirror device,

mirror driving means for driving the mirror device,

a diaphragm device,

diaphragm driving means for driving the diaphragm device,

starting means for starting the shutter driving means, the mirror driving means and the diaphragm driving means,

a magnetic release device for actuating the starting means and including an electromagnet, coupling means magnetically responsive to the electromagnet and coupled to the starting means for actuating the starting means in response to the energization of the electromagnet and release thereof, and

a dust proof case for casing the electromagnet and the coupling means, a portion of the coupling means projecting from the case for coupling to said starting means.

4,179,207

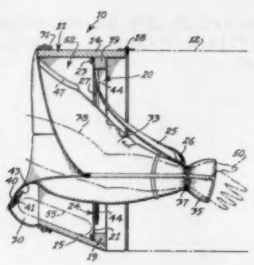
DAYLIGHT LOADER COVER DEVICE FOR PHOTOGRAPHIC PRINTING MACHINE

E. W. Phillips, P.O. Box 42, Hixson, Tenn. 37343

Filed Jan. 2, 1979, Ser. No. 124

Int. Cl.[2] G03D *17/00*

U.S. Cl. 354—308 **9 Claims**



1. A daylight loader cover device adapted to cover the opening of the loader compartment of a photographic printing machine comprising:

(a) an open frame having a perimetric, light-impervious wall and spaced front and rear openings,

(b) means for mounting said frame upon the loader compartment so that said rear opening registers with the opening of the loader compartment in operative position,

(c) a rear curtain of light-impervious material attached to said frame closing said rear opening,

(d) a rear passage through said curtain, and means for opening and closing said passage,

(e) a front cover of flexible, light-impervious material attached to said frame and spaced in front of said rear curtain to form an antechamber between said front cover and said rear curtain,

(f) at least one flexible sleeve appendage projecting from and opening through said front cover and terminating in a cuff having a wrist opening, adapted to snugly fit around the wrist of a person loading the machine, said sleeve appendage being capable of being inverted and being long enough when inverted to project rearward through said antechamber and said curtain passage into the loader compartment of the photographic printing machine in operative position, and

(g) a front passage through said front cover, and means for opening and closing said front passage.

4,179,208

HORIZONTAL ONE STEP AUTOMATIC PLATE PROCESSOR

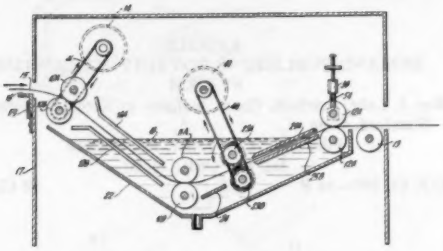
Peter V. Martino, 99-60 65th Rd., Rego Park, N.Y. 11374

Continuation of Ser. No. 785,985, Apr. 8, 1977, Pat. No. 4,119,991. This application Jun. 15, 1978, Ser. No. 915,742

The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.

Int. Cl.[2] **G03D** *3/08*

U.S. Cl. 354—320 **16 Claims**



1. An apparatus for continuously processing a printing plate in a horizontal through-put manner, comprising:

a tank for containing the processing solution, said tank having an entry end and a delivery end;

a pair of substantially parallel entry rollers disposed adjacent the entry end of said tank, said rollers being disposed one above the other above the solution, with the top roller leading the bottom roller to form a downwardly directed nip for receiving the plate and driving it towards the processing solution;

a pair of substantially parallel orientation rollers disposed adjacent said entry rollers, said orientation rollers being disposed one above the other to form a nip for receiving said plate and transporting it in a horizontal direction, said orientation rollers being submerged in the processing solution;

plate deflector means disposed adjacent the nip of said orientation rollers within the processing solution for directing said plate upwardly;

a pair of brush rollers disposed adjacent said deflector means, and one above the other with the top brush roller trailing the bottom brush roller to form an upwardly directed nip for receiving the plate, directing it in an upward direction and scrubbing both sides of said plate, said nip being disposed within the solution such that the plate is fully submerged in the solution as it is being scrubbed, said brush rollers being adapted to rotate at a higher speed than said orientation rollers and entry rollers;

a pair of squeegee rollers disposed adjacent the said brush rollers, one above the other to form a nip for receiving the plate, removing excess solution from the plate, and transporting the plate in a horizontal direction towards the delivery end of the tank;

means for rotating said entry rollers, orientation rollers, and squeegee rollers at substantially the same speed;

and means for rotating said brush rollers at a speed greater than that of said entry rollers, orientation rollers, and squeegee rollers.

4,179,209

MULTICOLOR LINE SCREEN

Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 3, 1977, Ser. No. 821,455

Int. Cl.[2] **G03G** *15/01;* **G03B** *27/32*

U.S. Cl. 355—3 P **14 Claims**

1. In a photoelectrophoretic imaging device comprising in combination

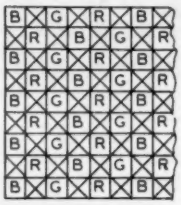
a blocking electrode;

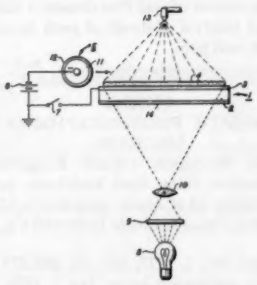
an injecting electrode;

inking means for applying a layer of a mono or polychromic photoelectrophoretic ink onto the injection electrode;

an imaging station wherein the blocking and injecting electrodes and applied ink are image-wise exposed, while in register, to a light pattern or image;

means for applying an electric field across the ink layer at least during image-wise exposure;





the improvement comprising a light filtering lattice arranged at the imaging station between the image-wise light pattern and the applied ink layer, said light filtering lattice being geometrically subdivided into repetitive areas of individual light reflective cells of at least three different colors, inclusive of red, green, blue and corresponding complementary colors, thereby forming positive and negative images on the respective electrodes as a plurality of separate but closely proximate loci corresponding to at least each cell of the filter lattice.

4,179,210

APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Friedrich Bestenreiner, Grunwald; Dieter Giglberger, Unterhaching; Karl Hoeft, Germering, and Robert Kohler, Olching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,541

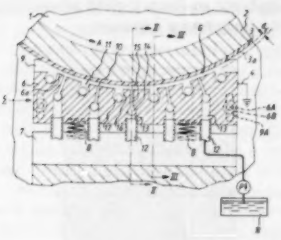
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644216

Int. Cl.[2] **G03G** *15/10;* **G03D** *3/02*

U.S. Cl. 355—10 **11 Claims**

1. In an apparatus for developing latent electrostatic images on carrier sheets, the combination of means for conveying carrier sheets in a predetermined direction along a predetermined path; electrode means adjacent to and defining with a carrier sheet in said path an elongated gap, said electrode means having at least one fluid-admitting first orifice communicating with said gap and at least two fluid-evacuating second orifices communicating with said gap, one of said second orifices being located ahead of and the other of said second orifices being located behind said first orifice, as considered in said direction, and said one second orifice being nearer to said

first orifice than said other second orifice; a source of pressurized developing fluid; and means for connecting said source with said first orifice so that the fluid issuing from said first orifice forms first and second streams flowing in and counter to said direction to respectively enter said other and said one second orifice whereby the speed of said first stream exceeds



the speed of said second stream as a result of movement of the carrier sheet in said direction, the distances between said first orifice and said second orifices being such that the interval of dwell of each increment of said first stream in said gap at least approximates the interval of dwell of each increment of said second stream in said gap.

4,179,211
ELECTROSTATIC PHOTOGRAPHIC COPYING MACHINE

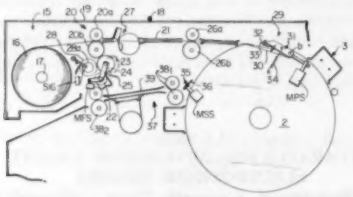
Hiroshi Kimura, Neyagawa; Takaich Kitagawa, Takatsuki; Masahiko Hisajima, Suita; Shoji Yoshikado, Sakai, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan and Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 2, 1977, Ser. No. 802,973

Claims priority, application Japan, Jun. 2, 1976, 51-72007[U]; Jun. 17, 1976, 51-79470[U]; Jun. 17, 1976, 51-79471[U]; Jun. 17, 1976, 51-96015[U]; Jun. 17, 1976, 51-96016[U]; Jun. 17, 1976, 51-96017[U]; Jun. 28, 1976, 51-76188; Oct. 4, 1976, 51-119600

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **102 Claims**



1. An electrostatic photographic copying machine comprising:

a rotatable master holding body adapted to have attached to the peripheral surface thereof an electrostatic photographic sensitive master paper;

a charging apparatus, a development apparatus and a transfer apparatus positioned along the passage of rotation of said surface of said master holding body;

an optical system to project an image of a copying original paper onto the surface of said master paper charged by said charging apparatus;

a transfer paper carrying passage to supply transfer paper to said transfer apparatus and to discharge transfer paper therefrom at a position whereat said image is transferred from said master paper to said transfer paper;

a fixing apparatus to fix the transferred image onto said transfer paper;

a master paper supply;

means for removing master paper from said surface of said master holding body;

means for feeding new master paper from said supply to said surface of said master holding body to replace the removed master paper; and

means for rotating said master holding body in a first forward direction during normal operation of the machine and during feeding of said new master paper to said master holding body and in a second reverse direction during removal of said master paper from said master holding body.

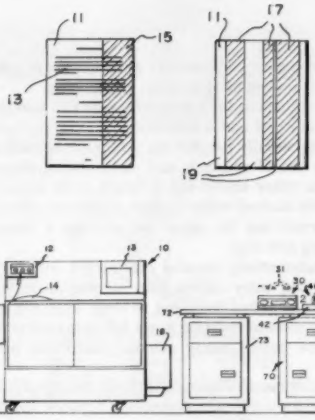
4,179,212
DEMAND PUBLISHING ROYALTY ACCOUNTING SYSTEM

Roy J. Lahr, Fairfield, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1977, Ser. No. 830,928

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **16 Claims**



1. An information coded paper document comprising:

(a) a paper base sheet;

(b) a plurality of invisible, electrically conductive, substantially parallel bands on said base sheet and having information coded thereon in units of specific electrical conductivity modified in accordance with an intelligence code;

(c) visual indicia on said base sheet and

(d) wherein said document may be reproduced by a compatible document copier which senses the coded information thereon.

4,179,213
VECTOR PINNING IN AN ELECTROPHOTOGRAPHIC MACHINE

Carl A. Queener, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,954

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R **15 Claims**

8. Apparatus for maintaining a white, gray or otherwise shaded or colored vector in an electrophotographic machine where said vector is the value of the image voltage on the photoconductor produced by imaging a single-shaded surface minus the developer bias voltage comprising:

a photoconductor;

a charge corona for laying down a relatively uniform charge on said photoconductor;

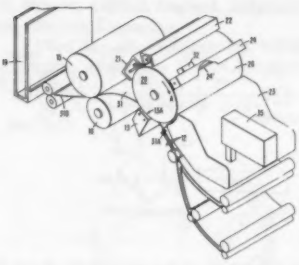
an erase lamp means for producing a discharged reference

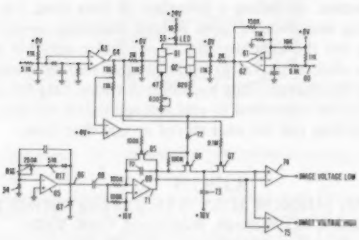
test area in the area of the photoconductor used for document reproductions;

a document lamp means for illuminating a single-shaded original for producing a charged test area in the area of the photoconductor used for document reproductions;

developing means for toning said charged test area;

reflectivity-sensing means for viewing said reference test area and producing a reference voltage therefrom;





said reflectivity means also viewing said charged test area and producing a representative image voltage therefrom;

first circuit means for comparing said reference and representative image voltages; and

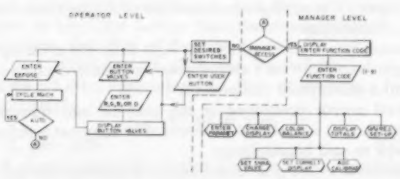
second circuit means for adjusting said apparatus for maintaining said vector to maintain the level of said vector within an acceptable predetermined range.

4,179,214

PHOTOGRAPHIC PRINTER CONTROL SYSTEM

John Poné, Jr., Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Jan. 9, 1978, Ser. No. 867,897
Int. Cl.² G03B *27/78*
U.S. Cl. 355—35 **10 Claims**



1. In a photographic printer, the improvement comprising:

storage means for storing alterable digital control information used to control printing, the control information including printer operating parameters for a plurality of setups for different film/photosensitive medium combinations;

digital processor means for controlling operation of the printer as a function of the stored alterable digital control information, the digital processor means controlling operation of the printer on first and second working levels, the first working level including initiating printing, applying user selected density corrections, selection of an automatic or manual printing mode, and selection of one of the plurality of setups, and the second working level including altering the alterable digital control information;

user input means for supplying input signals to the digital processor means to affect operation on the first or second working levels; and

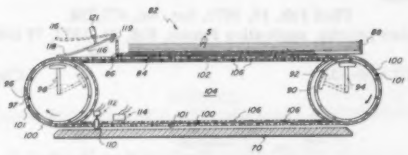
security means for normally permitting input signals supplied by the user input means to affect operation of the printer only on the first working level, and permitting input signals supplied by the user input means to affect operation of the printer on the second working level only if an authorization condition has been met.

4,179,215

RECIRCULATING DOCUMENT FEEDER

Charles T. Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,257
Int. Cl.² G03B *27/48, 27/50;* G03G *15/00;* B65H *5/22*
U.S. Cl. 355—50 **9 Claims**



1. In an apparatus for feeding document sheets seriatim to an exposure station of a copier for exposure, including support means for receiving and holding a plurality of document sheets, means for removing the sheets sequentially from the support means and means for returning the removed sheets to the support means following a plurality of exposures at the exposure station, the improvement comprising:

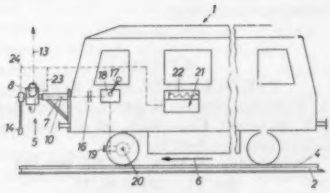
means for repeatedly transporting the removed sheets seriatim to the exposure station for exposure prior to returning the removed sheets to said support means.

4,179,216

APPARATUS FOR MEASURING THE PROFILE OF A RAILROAD TUNNEL

Josef Theurer, and Klaus Riessberger, both of Vienna, Austria assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b. H; Vienna, Austria

Filed May 18, 1978, Ser. No. 907,813
Claims priority, application Austria, May 31, 1977, 3848/77
Int. Cl.² G01C *3/08;* E01B *35/02*
U.S. Cl. 356—4 **11 Claims**



1. A mobile apparatus for measuring and indicating the profile of a bounded space surrounding a track having two rails and a longitudinal axis intermediate and parallel to the track rails, which comprises

(a) a distance measuring instrument capable of continuously receiving a signal corresponding to the distance of the profile of the bounded space from the instrument,

(b) a car mounted for mobility on the track rails and supporting the instrument for pivoting about an axis extending parallel to the longitudinal track axis,

(c) a drive arranged to pivot the instrument about the axis extending parallel to the longitudinal track axis whereby the instrument may sweep the profile of the bounded space and continuously receive the signal, (1) the drive comprising a rotatable axle extending in the pivoting axis,

(d) a drive for moving the car on the track rails,

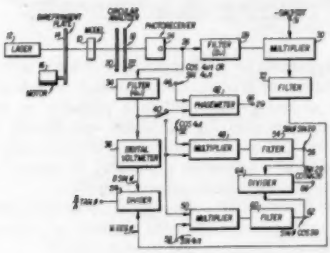
(e) a transmission means connecting the rotatable axle to the car drive for pivoting the distance measuring instrument in synchronism with the car drive, and

(f) an indicating instrument operatively connected to the distance measuring instrument and capable of indicating the signal received thereby.

4,179,217
DYNAMIC PHOTOELASTICIMETER WITH ROTATING BIREFRINGENT ELEMENT

André J. Robert, Paris; Jean C. Filippini, Grenoble, and Michel Ferré, Palaiseau, all of France, assignors to Etat Francais as represented by the Delegue General pour l'armement, Paris, France

Filed Feb. 14, 1978, Ser. No. 877,758
Claims priority, application France, Feb. 21, 1977, 77 04871
Int. Cl.[2] G01J *4/04*; G01L *1/24*
U.S. Cl. 356—33 **5 Claims**



1. A dynamic photoelasticimeter for measuring as a function of time the birefringent parameters θ (t) and θ (t) of a model at a point subjected to stresses comprising, in succession

a birefringent plate rotatable at a constant angular speed;

a circular analyzer, said model being interposed between said birefringent plate and said circular analyzer;

a photoelectric receiver;

means for detecting the output signals from said photoelectric receiver at frequencies of 2ω and 4ω;

means for determining the ratio of the amplitudes of said 2ω and 4ω output signals; and

means for detecting the phase of said 4ω signal with respect to a reference frequency.

4,179,218
PARTICLE SIZE ANALYZER

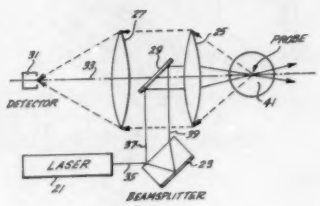
Joachim C. Erdmann, Seattle; Robert I. Gellert, Redmond, and Richard L. Skaugset, Kennewick, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 15, 1978, Ser. No. 905,793
Int. Cl.[2] G01N *21/26*
U.S. Cl. 356—336 **16 Claims**

1. A particle size analyzer comprising:

a crossed beam laser anemometer that produces a non-contacting probe formed of a series of fringes that produce blinking scattered light when a particle passes transversely through the series of fringes, detects the blinking scattered light produced by particles passing through said fringes and produces a fluctuating output signal having a magnitude related to the magnitude of the light scattered by particles passing through said fringes;

analyzing means for: (a) receiving the fluctuating output signal of said crossed beam laser anemometer; (b) verifying that a particle causing a fluctuating output signal has passed through a number of fringes of said probe above a predetermined number; and (c) producing a coded output signal if the particle causing said fluctuating output signal has passed through said number of fringes, said coded



output being a function of the magnitude of said fluctuating output signal:

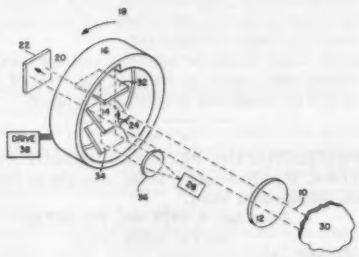
storage means, including a plurality of data bins, for: (a) receiving said coded output of said analyzing means; (b) reading out the data stored in a particular data bin each time a coded output occurs; (c) changing said data; and (d) writing the changed data back into the same data bin; and,

readout means connected to said storage means for sequentially reading out the data stored in said data bins.

4,179,219
REVOLVING MIRROR SCANNING INTERFEROMETER

Stanley T. Smith, 612 Weiman, Ridgecrest, Calif. 93555

Filed Apr. 10, 1978, Ser. No. 894,675
Int. Cl.[2] G01B *9/02*; G01J *3/00*
U.S. Cl. 356—346 **8 Claims**



1. A spectral scanning interferometer of a light beam from a source comprising:

a beamsplitter in the path of said light beam for dividing said light beam into two components, a reflected component and a transmitted component,

a fixed mirror positioned in the path of said transmitted component so that said transmitted component is reflected back to said beamsplitter;

an aspheric cylindrical drum mirror positioned around said beamsplitter such that whereever said reflected component impinges on said drum mirror said reflected component is reflected back to said beamsplitter;

means attached to said drum mirror for rotating said drum mirror, whereby said component reflected from said beamsplitter to said drum mirror and back travels a different path length for every possible orientation of said drum mirror as it rotates;

an output mirror positioned in the path of the light from said beamsplitter caused by the recombining of said two com-

ponents at said beamsplitter for reflecting the image of said recombined components away from said drum mirror; and

means for detecting said reflected image optically positioned in line with said output mirror.

4,179,220

APPARATUS FOR ANAEROBIC DIGESTION OF BIODEGRADABLE WASTE MATERIAL

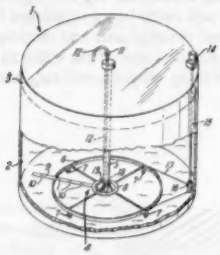
George M. Rippon, Ashford, England, assignor to Biomechanics Limited, Ashford, England

Filed Jun. 28, 1978, Ser. No. 919,809

Claims priority, application United Kingdom, Jul. 5, 1977, 28183/77

Int. Cl.[2] B01F *7/16*

U.S. Cl. 366—102 **8 Claims**



1. Apparatus for anaerobic digestion of biodegradable waste material comprising a closed substantially vertical cylindrical tank having a central axis, a gas delivery duct having an outlet disposed near to the central axis of the tank and to the base of the tank, a mixing assembly located within the tank for rotation about the central axis of the tank, the mixing assembly comprising an annular gas-holding member which has an open lower surface and which defines an annulus concentric with the said central axis, a part of the annulus defined by the gas-holding member being positioned above the outlet of the gas delivery duct, and a gas distribution arm extending substantially radially outwardly from the said gas-holding member towards the periphery of the tank and having exhaust apertures spaced along the length of the arm for delivering gas from the gas-holding member at different radial distances along the arm, supporting means for supporting the gas-holding member and the gas distribution arm near the base of the tank, and drive means for causing the mixing assembly to be rotated about the said central axis.

4,179,221

PLOUGH-SHARE-LIKE MIXING TOOL

Roland Lucke, Paderborn-Wewer, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbaugesellschaft mbH, Paderborn, Fed. Rep. of Germany

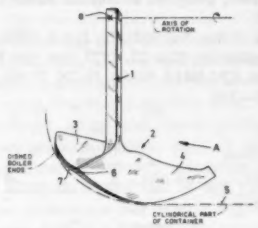
Filed Jun. 13, 1978, Ser. No. 915,251

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729477

Int. Cl.[2] B01F *7/00*

U.S. Cl. 366—309 **5 Claims**

1. A plough-share-like mixing tool for a mixing mechanism rotatably mounted in a mixer with a cylindrical mixing container having dished boiler ends, which mixing tool is carried at the outer end of a radial arm adapted to be mounted to the shaft of a mixing mechanism and with the radial outer surfaces thereof brushing the internal wall of the mixing container, the radially outermost portion of said mixing tool being asymmetrical and forming a convexly curved envelope corresponding to the curvature of the internal surface of the dished boiler end, one section of said mixing tool being, in plan view, disposed on one side of said radial arm and being provided with an extension to penetrate into the cylindrical part of the container, the other section of said tool being, in plan view, disposed on the



opposite side of said radial arm and provided with a shaving portion to produce a shaving action on a dished boiler end.

4,179,222

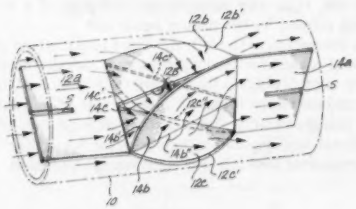
FLOW TURBULENCE GENERATING AND MIXING DEVICE

John R. Strom; George W. Finch, and Harvey W. Weyrick, all of Seattle, Wash., assignors to Systematix Controls, Inc., Seattle, Wash.

Filed Jan. 11, 1978, Ser. No. 868,490

Int. Cl.[2] B01F *5/00*

U.S. Cl. 366—337 **3 Claims**



1. In combination with an elongated tubular duct adapted to conduct fluid axially therein, turbulent mixing apparatus comprising flow divider means fixedly mounted in said duct comprising a plurality of pairs of elongated septum panels mounted at successively spaced locations along said duct, the respective panels of each such pair having substantially planar first end portions constituting a minor fraction of the lengths of such panels and disposed in longitudinally overlapping and mutually transverse relationship, intersecting along the duct axis, said septum panels of each pair further having second end portions projecting longitudinally from the respective first end portions and each including two longitudinally coextending panel elements transversely angled in mutually divergent relationship, with inner edges forming a progressively widening gap between them along the duct axis and with outer edges extending along the duct interior wall, the angling of the two panel elements of one such second end portion being in the opposite hand from that of the two panel elements of the other second end portion as viewed in the same direction along the duct, the transversely angled panel elements of each septum panel pair longitudinally overlapping those of respectively adjacent septum panel pairs.

4,179,223

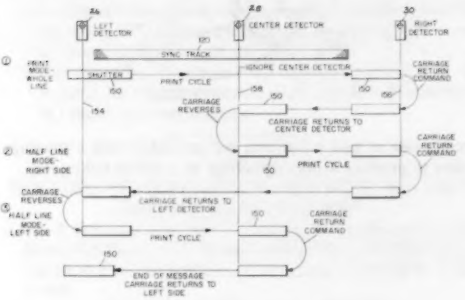
PRINTER CENTER SENSING MECHANISM

Okun Kwan, Trumbull, and Nicholas Zaccagnino, Stamford, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 702,279, Jul. 2, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,559

Int. Cl.[2] B41J *19/14, 19/78, 21/00, 21/00*

U.S. Cl. 400—320 **19 Claims**



5. In a printer mechanism, a center sensing system comprising:

a frame for supporting components of the mechanism;

a movable carriage for supporting a printer head;

means mounted to the frame for guiding the motion of the carriage;

left, right and intermediately disposed photodetecting means mounted in colinear spaced relationship to each other, and stationary with respect to the frame;

shutter means mounted to the carriage for movement therewith, the shutter means detected by the respective photodetecting means when the carriage passes by corresponding left, right and intermediate margins of a document being printed by the printer head; and

means connected to the left, right and intermediate photodetecting means for feeding detection signals therefrom to logic control circuits for selective elimination of full travel by said carriage on one or another side of said intermediate margin position by providing at least one additional optional starting and stopping point for a line of print intermediate said left and right margin positions.

4,179,224

SELF-CENTERING PRESSURE ROLLER FOR SHEET FEEDING MECHANISM

Edward Feldman, Teaneck, and Heinz R. Guenther, Cedar Knolls, both of N.J., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 754,861, Dec. 27, 1976, abandoned. This application Mar. 30, 1978, Ser. No. 892,006

Int. Cl.[2] B41J *13/02*

U.S. Cl. 400—637 **15 Claims**

1. A paper web feed apparatus comprising, in combination:

a platen mounted for rotation about a rotation axis;

a pair of pressure rollers each rotatable about a rotation axis;

a roller support bracket for supporting said pressure rollers for paper web against the platen; said rotation axis of each said roller is parallel to said rotation axis of the other said roller;

bracket support means operative to support said bracket in a manner constraining said bracket to linear movement along a line relative to a fixed point in space and permitting rotation of said bracket in three orthogonal degrees of freedom about said fixed point in space independently of the extent of said linear movement; and

said platen, said pressure rollers and said bracket are dimensioned so that two unique lines may be drawn in a plane including a line colinear with said linear movement of said bracket in one degree of freedom, each said unique line being drawn perpendicularly through said platen rotation axis and through the rotation axis of one said pressure roller and two further unique lines may be drawn in said plane each perpendicular to one of said two lines and perpendicular to one said pressure roller rotation axis, said two further lines intersecting each other at a second point in space so that said fixed point in space lies between said second point in space and said platen rotation axis.

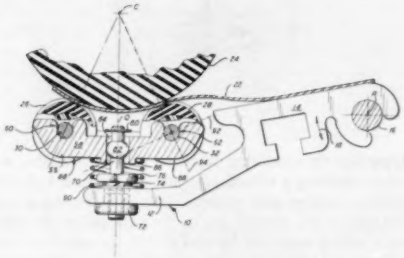
5. A paper feed mechanism comprising, in combination:

a platen mounted for rotation about a longitudinal rotation axis;

a pair of pressure rollers, each said roller being generally cylindrical in shape with a longitudinal rotation axis, a centrally located undercut portion and an elevated end portion on either side of said centrally located portion;

a roller mounting bracket for supporting said pair of pressure rollers, each said roller being supported for rotation about its longitudinal rotation axis and disposed parallel to the longitudinal rotation axis of the other said roller;

a bracket positioning means permitting linear movement of



said bracket in one degree of freedom relative to a fixed point in space and permitting rotation of said bracket in three orthogonal rotational degrees of freedom about said fixed point in space independently of the extent of linear movement;

means to urge said bracket toward said platen to place each said pressure roller into pressure contact with said platen;

said platen, said pressure rollers and said bracket are dimensioned so that two lines may be drawn in a given plane including a line co-linear with said linear movement of said bracket, each said line being drawn perpendicularly through said platen rotation axis and through the rotation axis of one said pressure roller and two further lines may be drawn in said plane each perpendicular to one of said two lines, said two further lines intersecting each other at a second point in space so that said fixed point in space lies between said second point in space and said platen rotation axis; and

said bracket positioning means comprising a stud with a longitudinal axis on which said bracket is free to move longitudinally along said stud, to rotate about the longitudinal axis of said stud and to pivot about any axis through and perpendicular to the longitudinal stud axis.

4,179,225

QUICKLY DETACHABLE COUPLING

Alf A. Asplund, Kristineham, Sweden, assignor to Agergards Maskiner AB, Karlstad, Sweden

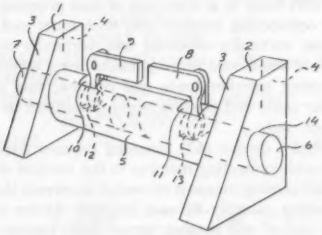
Continuation-in-part of Ser. No. 762,214, Jan. 24, 1977. This application Jul. 28, 1978, Ser. No. 929,070

Int. Cl.[2] B25G *3/18*

U.S. Cl. 403—322 **3 Claims**

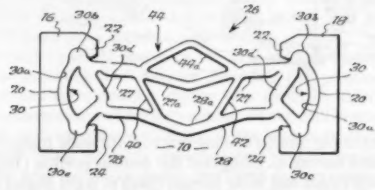
1. Means for coupling a working vehicle to a work attachment to be pulled by said vehicle, comprising

(a) a first assembly comprising
(i) two wedge shaped members each having a transverse orifice in its central portion;
(ii) an at least partly hollow pipe member extending into said transverse orifice of each of said wedge members to provide a fixed connection therebetween;
(iii) two locking bars mounted for sliding movement in opposite ends of said hollow pipe member, each said locking bar having a recess therein;
(iv) two lever means pivotally mounted on said pipe member and having depending portions each engaging a said recess in a said locking bar, whereby said locking bars are slidable within said hollow pipe member; and



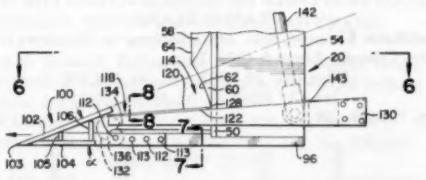
(b) a second assembly comprising
(i) a set of two substantially parallel members each having an interior cavity congruent with that of each of said wedge-shaped members, for receiving said wedge-shaped members during coupling;
(ii) an orifice in the wall of each of said last-mentioned members facing away from the other of said last-mentioned members, said orifices being in substantial alignment with said locking bars, whereby upon sliding movement of said locking bars said ends thereof are received in said orifices, for coupling said working vehicle to said work attachment.

4,179,226
ELASTOMERIC EXPANSION SEAL
Guy S. Puccio, Snyder, N.Y., assignor to Acme Highway Products Corporation, Amherst, N.Y.
Filed Oct. 2, 1978, Ser. No. 947,489
Int. Cl.[2] E01C *11/10*
U.S. Cl. 404—64 **7 Claims**



1. An expansion joint seal for bridging and sealing a gap between a pair of spaced-apart elongated edge members being respectively disposed in a pair of structural slabs to define the gap therebetween, each said edge member having in cross-section a generally C-shaped cavity with a preselected radius of curvature, each said cavity opening towards said gap defined between said edge members wherein each said cavity opening is defined between opposed projecting portions of said respective edge members spaced from each other at a distance less than the maximum dimension within said cavity taken generally parallel to said opening, said seal comprising:
a web portion spanning said gap and a mounting bead portion extending along each longitudinal edge of said web portion wherein each of said mounting bead portions is received within said cavity of a corresponding edge member, and each said mounting bead having in cross-section an outer surface portion for matching engagement with said cavity with opposed portions of said mounting bead correspondingly abutting said opposed projecting portions of said edge member whereby relative lateral movement of said mounting bead with respect to said edge member is resisted and, said web portion including upper and lower walls spaced apart from one another to span said gap and being attached along their longitudinal edges to correspondingly upper and lower portions of said mounting bead portions wherein each of said walls includes a longitudinal, downwardly extending fold located substantially along the center line of said gap, said web portion further including a pair of strut members extending between said walls in a downwardly converging relationship with respect to one another for coordinating the movement of said walls during expansion and contraction of said seal, and the upper surface of said upper wall having an inverted V-shaped crown portion joined thereto and located substantially along the center line of said gap whereby the apex of said crown portion is adapted to remain disposed below the upper surface of the structural slabs associated therewith throughout the operational range of said seal.

4,179,227
DYNAMIC PLOW ASSEMBLY AND METHOD OF OPERATING SAME
James L. Child, Jr.; James L. Fouss, and Erwin K. Nowicki, all of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio
Filed Aug. 17, 1977, Ser. No. 825,192
Int. Cl.[2] F16L *1/00*; E02F *5/10*
U.S. Cl. 405—182 **42 Claims**



1. A method of generating a trench-like area in the soil comprising the steps of:
(a) providing a first plow member having a base, a tapered forward nose portion, and a top section extending rearwardly from said nose portion over said base;
(b) positioning said first plow member at a predetermined distance beneath the surface of the soil with its base extending generally horizontally;
(c) moving said plow member through the soil in the direction of its nose portion;
(d) oscillating said top section and rupturing the soil above said plow member by pivotally moving said top section up and down in a generally vertical plane at a rate in the range of 20 to 120 cycles per minute simultaneously with said step of moving said plow member through the soil; and
(e) each said cycle being from a first position in which said top section extends generally parallel to said base then upwardly through an angle in the range of 15 to 30 degrees to a second position and then back to said first position.

4,179,228

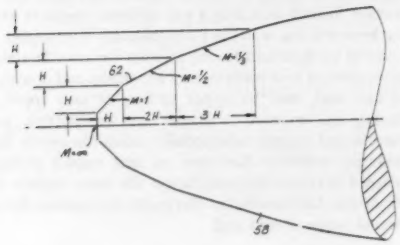
NUMERICALLY CONTROLLED MILLING WITH PARABOLIC PROFILE TOOLS FOR SURFACE SMOOTHNESS

Joseph A. Ross, Fort Salonga, and Howard K. Stern, Greenlawn, both of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Division of Ser. No. 801,818, May 31, 1977. This application Jul. 21, 1978, Ser. No. 926,930

Int. Cl.[2] B23C *5/04*

U.S. Cl. 407—57 **2 Claims**



1. A cutting tool with cutting edges having a parabolic profile, said profile being comprised of cutting surfaces interconnected to form said parabolic profile, the slopes on said cutting tool varying in value from zero to infinity, said cutting tool having an axis of rotation and a free end, said cutting tool having cutting edges with slopes varying in value from substantially infinity as said free end of said tool to zero at a predetermined distance along said axis of rotation from the end of said tool, said tool being selectively positioned for locating the cutting surface conforming to the desired slope against the surface to be machined.

4,179,229

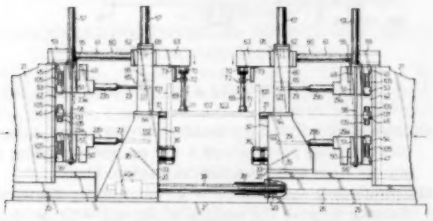
MULTIPLE SPINDLE DRILLING MACHINE FOR WIDE FLANGE BEAMS

Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company Limited, Gifu, Japan

Filed Dec. 19, 1977, Ser. No. 861,550

Int. Cl.[2] B23B *41/00, 39/18, 39/22*

U.S. Cl. 408—39 **9 Claims**



1. A multiple spindle drilling machine having a frame for receiving wide flange beams at a work station, comprising in combination:

(a) guide members vertically movable and vertically disposed on a pair of gear boxes (**21,27**) at said work station;

(b) horizontal drills disposed on each guide member in two upper and lower rows (**111, 112, 121, 122**), so arranged and disposed that when they are moved and brought close to a wide flange beam at said work station together with said gear boxes, both flanges of the wide flange beam are drilled;

(c) at least one pair of gripping members (**31**) mounted on inner side faces of each gear box to grip and immovably fix a wide flange beam from both sides (**101**) thereof at said work station previous to the drilling operation;

(d) sensing means (**69**) having a lower end (**71**) and a top end and being capable of bearing against a web surface of a wide flange beam, said sensing means (**69**) being attached to a part of each guide member;

(e) a centering device for vertically moving said sensing means (**69**) together with the guide member and stopping said vertical movement when the sensing means bears against the web surface of the wide flange beam so that the central position between the two rows of the drills is made to agree with the center of the thickness of the web of the wide flange beam, said centering device including, a fixed stand (**59**) fixed to at least one of said gripping members, and a connecting member (**60**) with inner and outer end portions vertically suported and vertically movable on said fixed stand, said sensing means being attached to said connecting member inner end portion, said connecting member outer end portion being connected to said guide member; and,

(f) a cylinder device (**62**) mounted on said fixed stand to move said connecting member in the vertical direction so that said sensing means is moved downwards through said connecting member by said cylinder device so that the lower end of said sensing means bears against the upper face of the web of the wide flange beam.

4,179,230

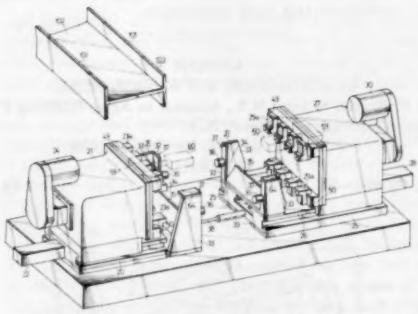
MULTIPLE SPINDLE DRILLING MACHINE FOR WIDE FLANGE BEAMS

Toshikatsu Kitagawa, Seki, Japan, assignor to Miyakawa Industry Company Limited, Gifu, Japan

Filed Feb. 6, 1978, Ser. No. 875,299

Int. Cl.[2] B23B *41/00, 39/22*

U.S. Cl. 408—39 **7 Claims**



1. A multiple spindle drilling machine for wide flange beams, said beams having an elongated flat central portion (**102**) with peripheral edges and wide flanges (**101**) at right angles to said central portion (**102**) and extending above and below said edges so that the cross-sectional configuration of said beam is H-shaped, said machine comprising in combination:

(a) a defined travel path with input and output ends including a lower bed (**2**) and an upper work station;

(b) at least one pair of spaced apart gripping members (**31**) mounted over said bed on both sides of said travel path with horizontal plates (**32**) thereon;

(c) at least one pair of flange support rollers (**36**) with at least one of said rollers (**36**) being attached to said gripping members (**31**), said rollers being disposed towards said lower bed (**2**) so as to receive said beam flanges (**101**) thereon;

(d) guide means (**20**) mounted on said bed including rails (**25**) for movement normal to and along said travel path between said input and output ends, gear box means (**21**)

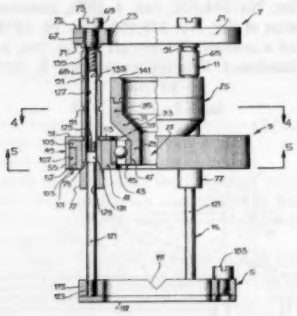
mounted on said rails supporting drills (23) so that said drills (23) can move in the longitudinal and withwide direction of said beam for drilling said beam; and

(e) moving means for moving at least one of said beam support rollers (36), said gripping members (31) and said gear boxes (21) integrally in the widthwise direction of the beam, said moving means including a sliding member disposed on the bed of the machine, said sliding member supporting said gear box and gripping member, and a screw lever (38) stretched across said bed (2) coupling said gripping members so as to move said gripping members with respect to each other, said screw lever (38) being rotatably inserted into said sliding member, and, motor means for driving and rotating said screw lever.

4,179,231
DRILL GUIDE

Terence B. Hadden, 1745 De Sève, Apt. 3, Montreal, Quebec, Canada (H4E 2B1)

Filed Oct. 30, 1978, Ser. No. 956,196
Int. Cl.[2] B23B *39/00*
U.S. Cl. 408—112 **6 Claims**



1. A drill guide comprising:

(a) drill holding means including a leg support, drill centering means and a set of tubular legs extending from the leg support to the centering means for connecting the same together, said drill centering means being slidably mounted on the legs for movement toward or away from the leg support and including means for fixing the drill,

(b) guide positioning means,

(c) a set of rods slidably mounted in the tubular legs for movably connecting the drill holding means and guide positioning means together, and

(d) manually operable means on the drill holding means for use in adjusting the distance between the positioning means and the centering means; said manually operable means comprising a locking member on the drill centering means and spaced-apart stops on the legs, said locking member being rotatably mounted on the drill centering means, and including means provided for retaining the locking member in a locked position, said locking member being operable to selectively cooperate with the stops to lock the drill centering means in a selected position on the legs.

4,179,232
MATERIAL CONVEYOR

Douglas E. Laseter, Jackson, Miss.

Filed Apr. 18, 1978, Ser. No. 897,338
Int. Cl.[2] B65G *53/46*
U.S. Cl. 406—63 **9 Claims**

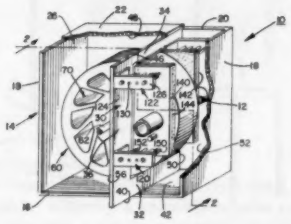
1. A device for conveying granular material comprising:

a housing having a material entrance defined therein;

an induction wheel rotatably mounted on said housing, said wheel having a plurality of elongate open-ended chambers defined therein;

a pair of wipers mounted on said housing adjacent said wheel and located so that said wheel passes between said wipers to gently remove excess material from the ends of said chambers without damaging that removed material, said pair of wipers including wipers spaced from each other to define a material escape path through which said gently removed material passes;

sealing means mounted on said housing to sealingly cover said chamber ends in a secure manner, said sealing means being separate from and spaced apart from said wipers to be located so that a chamber on said induction wheel



passes between said pair of wipers prior to passing said sealing means, said wipers removing excess material from adjacent the ends of a chamber before such chamber is sealed by said sealing means so that material does not interfere with any seal formed between said sealing means and said chamber ends such that said chambers are securely closed to minimize loss of any gas introduced into said chambers for moving material out of said chambers;

gas introducing means connected to said sealing means to introduce gas from a source into a chamber; and

material transport means connected to said sealing means to receive gas and material from said chambers for transporting said material away from said induction wheel.

4,179,233
VERTICAL MOTION COMPENSATED CRANE APPARATUS

Raymond J. Bromell, Dallas, and John N. J. Sideris, Grand Prairie, both of Tex., assignors to National Advanced Drilling Machines, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 815,529, Jul. 14, 1977, abandoned. This application Sep. 30, 1977, Ser. No. 838,085
Int. Cl.[2] B66C *23/76*
U.S. Cl. 414—139 **15 Claims**

1. Load transfer apparatus comprising:

(a) boom means secured to a first platform and extending over a second platform,

(b) hoist means comprising a winch, a boom sheave secured to said boom means above said second platform, and a cable secured to said winch and passing over said boom sheave to support load hook means above said second platform,

(c) relative vertical motion compensation means secured to said boom means comprising a cylinder and piston assembly operative to vary the vertical distance between said boom sheave and said load hook means in response to relative vertical movement between said first platform and said second platform,

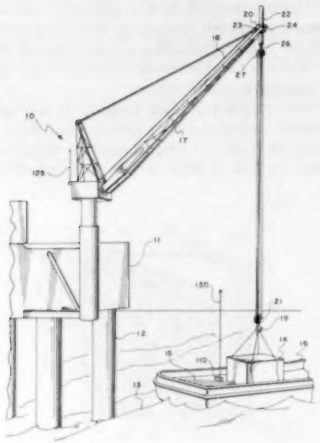
(d) means to selectively supply fluid to and remove fluid from said cylinder, thereby to raise and lower said piston in said cylinder,

(e) first sheave means supported by said piston,

(f) second sheave means supporting said load hook means, said cable being reeved between said first and second sheave means,

(g) sensing means to detect relative vertical movement be-

tween said first platform and said second platform and generate a signal in response to said relative movement, and



(h) control means responsive to said signal and operative in response thereto to control said means to selectively supply fluid to and remove fluid from said cylinder.

4,179,234

BLENDING FLOWABLE SOLID MATERIALS

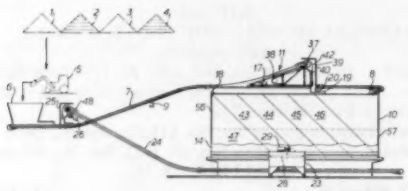
William Young, Swanley, England, assignor to Davy International (Oil & Chemicals) Limited, London, England

Filed Mar. 14, 1978, Ser. No. 886,562

Claims priority, application United Kingdom, Mar. 15, 1977, 10922/77

Int. Cl.[2] B65G *65/32*

U.S. Cl. 414—268 **23 Claims**



10. Apparatus for blending flowable solid materials comprising means defining a first storage location; feed means for feeding the flowable solid materials continuously in turn to the first storage location so as to establish at the first storage location an elongate first charge of the materials to be blended of substantially uniform height comprising a plurality of contiguous transverse first bands, each extending from top to bottom of the first charge and each being comprised of a different flowable solid material from that of the or each adjacent first band; first extractor means longitudinally traversable with respect to the first storage location for removing material from the first charge; means for traversing the first extractor means longitudinally of the first charge in a plurality of first passes and arranged to remove material from each first band in turn in each first pass, the quantity of material removed from the first charge in each first pass being small in comparison to the initial volume of the first charge; means defining a second storage location; conveying means for conveying to the second storage location material removed from the first charge and arranged so as to establish at the second storage location an elongate second charge of substantially uniform height comprising a plurality of contiguous transverse second bands, each extending from top to bottom of the second charge and each being composed substantially of material removed from a corresponding first band; second extractor means traversable with respect to the second storage location for removing material from the second charge; and means for traversing the second extractor means longitudinally of the second charge in a plurality of second passes and arranged so as to remove material from each second band in turn during each second pass, the quantity of material removed from the second charge on each second pass being small in comparison to the initial volume of the second charge.

4,179,235

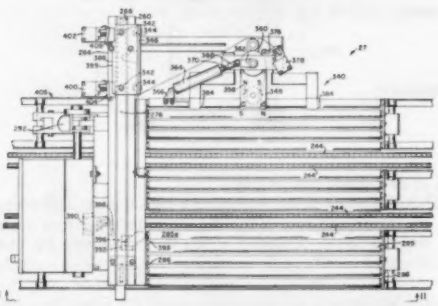
PAN STACK RETRIEVER DOLLY

William E. Lanham; William E. Lanham, Jr., and Gene C. Miller, all of Decatur, Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Division of Ser. No. 584,026, Jun. 4, 1974, abandoned, which is a continuation of Ser. No. 325,108, Jan. 19, 1973, Pat. No. 3,937,335, and a continuation-in-part of Ser. No. 243,074, Apr. 11, 1972, abandoned. This application Sep. 8, 1977, Ser. No. 831,481

Int. Cl.[2] B65G *1/06*

U.S. Cl. 414—351 **4 Claims**



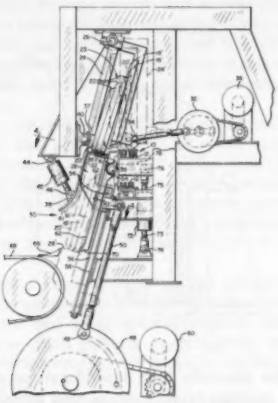
1. A pan retriever dolly for transferring a stack of pans or the like from a stack storage conveyor to a stack conveyor, said dolly comprising stack-engaging means for operatively engaging a stack of pans on said storage conveyor and for moving said stack over and onto said stack conveyor, said stack-engaging means including a relatively rigid retriever arm mounted on said dolly for reciprocating movement across said stack conveyor, towards and away from said storage conveyor, a magnet mounted on said retriever arm, and means for selectively reciprocating said retriever arm across said stack conveyor; said dolly including pan support means vertically movably mounted on said storage dolly, means for raising and lowering said pan support means between positions above and below said stack conveyor, means for actuating said raising and lowering means to raise said pan support means as said retriever arm is moved towards said storage conveyor, and means on said retriever dolly for determining movement of said arm into a predetermined position adjacent said storage conveyor and for reversing said reciprocating means to return said arm towards a predetermined position remote from said storage conveyor, whereby the retrieved stack is supported above said stack conveyor, as said arm is moved away from said storage conveyor with a stack of pans magnetically secured to said arm.

4,179,236

BOARD SEPARATOR

Aaron U. Jones, Eugene, Oreg., assignor to Seneca Sawmill Company, Inc., Eugene, Oreg.

Filed Mar. 15, 1978, Ser. No. 886,879
Int. Cl.[2] B65G *59/08*
U.S. Cl. 414—117 12 Claims



1. Board separating apparatus, comprising:
input conveyor means for conveying boards in groups with each group including a plurality of boards;
separator means for separating the boards of each group;
transfer means for transferring the groups of boards from said input conveyor means to an input position at the input of the separator means;
said separator means including elevator means for lowering the groups of boards from said input position to a separation position within said separator means;
separator arms aligned with the group of boards in said separation position; and
control means for moving the separator arms to cause them to move the boards in each group off the elevator means one at a time in said separation position to separate the boards from each other and cause them to be discharged at different times from the outlet of said separator means.

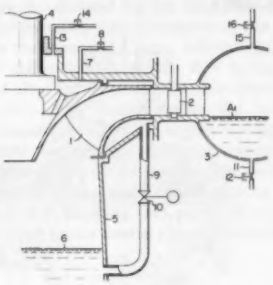
4,179,237

METHOD FOR CONTROLLING THE OPERATION OF A FLUID MACHINE IN SPINNING RESERVE

Kenzyu Ogiwara; Hisao Inoue, and Susumu Naganuma, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1977, Ser. No. 840,727
Claims priority, application Japan, Oct. 8, 1976, 51-120387
Int. Cl.[2] F01D *19/00*
U.S. Cl. 415—1 5 Claims

1. A method for controlling the operation of a fluid machine in spinning reserve wherein the runner is rotated in compressed air atmosphere in the runner chamber for practicing a phase modifier operation or for producing a standby condition which permits immediate switchover to a power-generating or pumping-up operation, comprising the steps of:
providing a fluid machine having a runner rotatably mounted in a runner chamber in communication between a high pressure casing through closable guide vanes and a low pressure portion, with a valve between the high pressure casing and a high pressure portion;
closing the guide vanes and closing the valve between the high pressure casing and the high pressure portion; thereafter with the guide vanes closed and the valve closed, introducing compressed air into the runner chamber so as to force the water level in the runner chamber down so that the runner may spin in a compressed air atmosphere during reserve; thereafter, while the runner is spinning in reserve in the compressed air, discharging water from the casing and simultaneously introducing compressed air into the casing to take the place of the discharged water to lower the water level within the casing with respect to the guide vanes so as to substantially prevent leakage of water



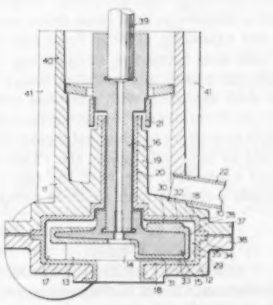
through the closed guide vanes from the casing into the runner chamber, whereby a spinning reserve condition may be obtained with a minimum quantity of compressed air to fill the runner chamber and thereafter the casing may be filled with compressed air to reduce leakage.

4,179,238

CENTRIFUGAL PUMPS

Stewart I. Ashworth, Vale, Channel Islands, assignor to Abrasives International Limited, West Midlands, England

Filed Jun. 8, 1977, Ser. No. 804,658
Claims priority, application United Kingdom, Jun. 8, 1976, 23547/76
Int. Cl.[2] F01D *5/28*
U.S. Cl. 415—197 4 Claims

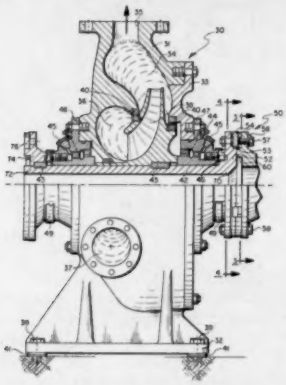


1. A centrifugal pump for pumping a mixture of abrasive particles and a carrier fluid, the pump comprising a casing having a hollow cylindrical interior defining a central axis, an axially disposed inlet and a tangentially disposed outlet, and an impeller rotatably mounted in the interior of the casing about said axis and comprising an imperforate disc of a diameter closely approaching the internal diameter of the casing and a plurality of imperforate rectangular blades extending radially of the disc to the circumference thereof, the radially outermost edges of the blades being parallel to and almost touching the cylindrical interior wall of the casing so that the rotating impeller, in use, sweeps substantially the entire volume of the interior of the casing, both the interior of the casing and the impeller being provided with a coating of abrasion resistant rubberlike material.

4,179,239
MODULAR PUMP UNIT FOR MULTISTAGE HIGH PRESSURE SLURRY PUMP

Fritz C. Catterfeld, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 23, 1978, Ser. No. 918,230
Int. Cl.[2] F04D *29/04;* F16D *1/02*
U.S. Cl. 415—198.1 **11 Claims**



1. In a multiple pump assembly wherein single pump units are connected in series to a drive means, the improvement which comprises:

a modular pump housing forming inlet and outlet means therein, said pump having a first mating coupling flange on an impeller shaft and a second mating coupling flange on a second end on said shaft,

conduit means connecting the outlet from one modular pump to the inlet of an adjacent pump,

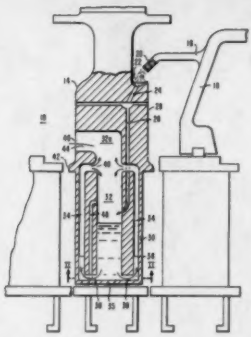
an axially adjustable, forced center drive coupling connectable to said first and second ends of said impeller shaft, said drive coupling having a circular disc forming an inner concentric opening with a conical surface therein, said disc further forming at least three drive keys equidistantly spaced and extending radially from said disc, said keys interfit with slots formed in an opposing coupling flange of an adjacent pump, said coupling flange having a short impeller shaft extension with a conical surface formed at its end to conform to said conical surface in said disc, said disc as it is moved by mechanical means from one mating flange into an opposing flange, the adjacent pump shafts are forced concentric one with the other, thus aligning one modular pump with an adjacent pump.

4,179,240
COOLED TURBINE BLADE

Richard E. Kothmann, Churchill, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,466
Int. Cl.[2] F01D *5/18*
U.S. Cl. 416—96 R **6 Claims**

1. A fluid cooled gas turbine blade having an airfoil portion and a root portion with at least one radially extending chamber within the airfoil portion of said blade, a first fluid channel providing a liquid coolant inlet to said chamber, a plurality of second fluid channels subadjacent the blade surface in said airfoil portion, each of said second channels having an inlet in fluid communication with said chamber subadjacent the top of said blade and an outlet in fluid communication with said chamber generally adjacent the root portion of said blade, a third fluid channel providing fluid communication from said chamber to exit the blade adjacent said tip, the entry to said third channel from within said chamber being disposed at an intermediate position in the radial extent of said chamber and generally radially inwardly of the desired depth of fluid accumulated therein to limit the depth of said fluid in said chamber from adjacent said tip to said entry position whereby any further fluid entering said chamber will exit via said third channel, and, an exhaust channel providing vapor flow communication from said chamber to exit said blade on the downstream face thereof adjacent said root portion whereby, liquid cooling fluid entering said blade is collected in said chamber

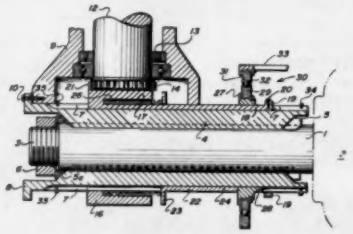


and under the generally high centrifugal force field of said blade when rotating enters each of said plurality of second channels for flow therethrough promoting vaporization of the liquid to cool the blade, and wherein the flow of the fluid in said second channels and the flow of said vapor generated therein are in a common direction from said tip to said root portion to provide stability for the fluid flow through all said second channels.

4,179,241
FULL FEATHERING, REVERSIBLE PITCH, CONSTANT RPM PROPELLER

Jacob B. Courshon, Jr., Park Forest, Ill., assignor to High Harbin, Elk Grove Village, Ill., a part interest

Filed Oct. 31, 1977, Ser. No. 847,245
Int. Cl.[2] B64C *11/34;* B63H *3/04*
U.S. Cl. 416—137 **2 Claims**



1. Variable pitch propeller means comprising:

(a) an engine shaft adapted to be rotated about its longitudinal axis,

(b) a plurality of propeller blades spaced around the longitudinal axis of the engine shaft, each propeller blade having a longitudinal axis arranged perpendicularly to the longitudinal axis of the engine shaft,

(c) first means mounting each of said propeller blades to said engine shaft for rotation about its respective longitudinal axis,

(d) a plurality of weights, each weight being secured to one of said propeller blades spaced from the longitudinal axis thereof, said weights being adapted to generate centrifugal force tending to rotate the propeller blades about their

respective longitudinal axes when said engine shaft is rotating,

(e) a plurality of spur gears, each spur gear being mounted to one of said propeller blades,

(f) a plurality of toothed racks, each toothed rack engaging one of said spur gears,

(g) second means mounting said toothed racks for movement longitudinally of said engine shaft,

(h) spring means bearing against said second means,

(i) third means bearing against said spring means and adapted to compress said spring means and thereby resiliently force said toothed racks longitudinally of said engine shaft to rotate said propeller blades about their respective longitudinal axes,

(j) the force exerted by said third means and resiliently applied to said toothed racks to rotate said propeller blades completing the balance of the centrifugal forces exerted by the weights and the aerodynamic pitching moments of the propeller blades, thereby providing constant RPM of the propeller blades at a desired value corresponding to the degree of compression of said spring means,

(k) fourth means adapted to move said second means and said third means to a first extreme position overriding said spring means and rotating said propeller blades to an extreme low pitch position or selectively to a second extreme position rotating said propeller blades to a reverse thrust position,

(l) a tubular sleeve mounted on said engine shaft and having radially spaced longitudinally extending splineways formed in the exterior surface thereof,

(m) said second means having radially spaced longitudinally extending splines, said splines being slidably received in the splineways of said tubular sleeve,

(n) said third means having radially spaced longitudinally extending splines, said splines being slidably received in the splineways of said tubular sleeve,

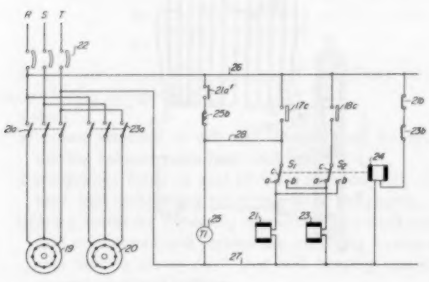
(o) said fourth means having radially spaced longitudinally extending splines, said splines being slidably received in the splineways of said tubular sleeve, said fourth means being adapted to move said third means in a first direction against said spring means or selectively to move said second means in the opposite direction.

4,179,242

METHOD AND APPARATUS FOR LIQUID SUPPLY

Tadao Tateshita, Kashiwa; Yasuhiro Mita, Kamagaya; Junichi Nakayama, Chiba, and Koichi Sato, Funabashi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 26, 1978, Ser. No. 900,320
Int. Cl.[2] F04B *41/06*
U.S. Cl. 417—8 **9 Claims**



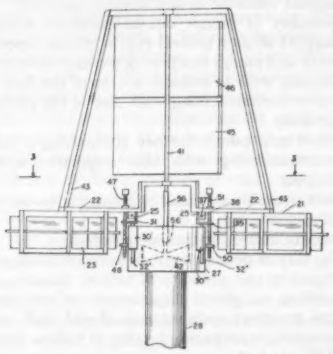
1. An apparatus for liquid supply comprising a plurality of pumps connected on the delivery sides to a main, a pressure tank provided on the delivery sides of said pumps, first sensor means for sensing the demand for the liquid and determining whether the preceding or regular one of said pumps should be started or not in response to a variation in the demand, second sensor means for sensing the demand for the liquid and determining whether the remaining or standby one of said pumps should be started or not in response to a variation in the demand, third sensor means for sensing the demand for the liquid and determining whether said regular pump may be stopped or not in response to a variation in the demand, fourth sensor means for sensing the demand for the liquid and determining whether said standby pump may be stopped or not in response to a variation in the demand, a timer which begins working upon receipt of the output from said first sensor means to generate a signal after the lapse of a predetermined period of time, standby-pump stop control means for stopping said standby pump immediately upon generation of a signal by said fourth sensor means, and regular-pump stop control means for keeping said regular pump running as long as said timer is in operation, regardless of the signal generation by said third sensor means, and for stopping said pump in response to a signal from said third sensor means after the operation of said timer.

4,179,243

FLOATATION PUMP DEVICE

Richard J. Aide, R.R. #2, Bismarck, N. Dak. 38501

Filed Jun. 21, 1977, Ser. No. 808,457
Int. Cl.[2] F04B *21/00*; B01F *3/04*
U.S. Cl. 417—61 **1 Claim**



1. A pumping device for pumping water from the bottom of a lake to the top of the lake for circulating water comprising raft means, said raft means comprising a plurality of floats mounted at spaced intervals to one another, elongated pipe means on said raft means extending vertically downward, a wind driven shaft rotatably mounted on said pipe means with a propeller at the lower end of the shaft within the upper end of the pipe means, whereby rotation of the shaft by the wind rotates the propeller to draw water up through the pipe means from the bottom of the lake out of the top of the pipe means to circulate the water, said pipe means being pivotally mounted at one upper end to said raft means, to pivot relative to said raft means about a horizontal axis at one of the spaced intervals between the floats from a horizontal position between said floats to a vertical position beneath said floats, locking means along the opposite upper end of said pipe means locking said pipe means to the raft means in a vertical position for use in circulating the water, said locking means when unlocked allowing the pipe means to be pivoted upward toward a horizontal position when not in use, said pivoting means and locking means being adapted to be reversed in function whereby said pivoting means may serve as said locking means and said locking means may serve as said pivoting means, said locking and pivoting means each having a vertical sliding connection to said pipe means with a threaded rod threadable to raise and

lower the pipe means relative to the raft means on said vertical sliding connection.

4,179,244

ROTARY LOW PRESSURE AIR DISPLACEMENT PUMP

Elwood Marple, Pinellas Park, Fla., assignor to Hargraves Aerobic Systems, Inc., Tampa, Fla.

Filed May 31, 1977, Ser. No. 802,131
Int. Cl.[2] F04B *1/04, 27/04*
U.S. Cl. 417—273 **5 Claims**

1. A multiple pump assembly for supplying fluid under different fluid pressure outputs to a plurality of utility devices, comprising in combination:

a housing member for enclosing the pump assembly;

a support mounted in said housing member;

a plurality of pumps circumferentially mounted on said support about a central region of said support;

each of said pumps comprising an inlet valve communicating directly with an ambient source of the fluid and an outlet valve communicating with one of the plurality of utility devices;

each of said pumps further comprising a bellow member communicating with said respective inlet and outlet valves;

a shaft rotatably mounted in proximity to said central region of said support;

eccentric means secured to said shaft;

a plurality of connecting rods interconnecting said eccentric means to said plurality of bellow members for providing uniform reciprocal displacement of said plurality of bellow members upon rotation of said shaft; and

means establishing said plurality of bellow members to be of different bellow cross-sectional areas to provide different fluid pressure outputs to the plurality of utility devices upon rotation of said shaft.

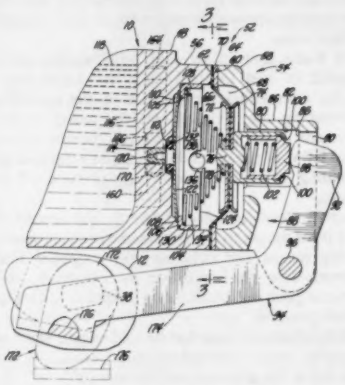
4,179,245

ACCELERATION PUMP WITH TEMPERATURE-RESPONSIVE CONTROL OF DELIVERY

William A. Fuller, St. Clair Shores, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Aug. 15, 1977, Ser. No. 824,829
Int. Cl.[2] F02M *7/08*
U.S. Cl. 417—292 **11 Claims**

1. A carburetor accelerating pump for discharging a first quantity of fluid when the fluid is at a first temperature and a second quantity of fluid when the fluid is at a second temperature, comprising body means formed to provide a pumping chamber having a movable wall, an inlet communicating between said pumping chamber and an associated source of supply of said fluid, a discharge outlet communicating between said pumping chamber and an associated fluid consuming area, movement in one direction of said movble wall with respect to said chamber causing said fluid to be drawn into said pumping chamber through said inlet and movement in an other direction of said movable wall causing fluid to be pumped from said pumping chamber, first calibrated passage means effectively communicating between said pumping chamber and said source of supply of said fluid, said first calibrated passage means being effective to cause a first portion of said fluid being pumped from said pumping chamber to be returned to said source of supply while permitting the remaining portion of said fluid being pumped from said pumping chamber to be pumped into said discharge outlet, and second calibrated passage means effective to communicate between said pumping chamber and said source of supply of said fluid, said second calibrated passage means being effective to meter a second portion of a magnitude different from said first portion of said fluid being



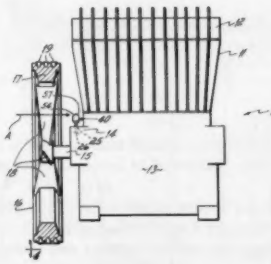
pumped from said pumping chamber to be returned to said source of supply while permitting the then remaining portion of said fluid being pumped from said pumping chamber to be pumped into said discharge outlet, said first and second calibrated passage means being in series flowing relationship to each other when said first portion of said fluid is being returned to said source, and temperature responsive valving means operatively associated with at least one of said calibrated passage means to effectively remove said first and second calibrated passages from series flow relationship when said fluid attains a preselected temperature.

4,179,246

CRANKCASE VENT APPARATUS AND METHOD

James W. Volker, Cincinnati, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Jan. 24, 1978, Ser. No. 871,780
Int. Cl.[2] F04B *21/00*
U.S. Cl. 417—313 **27 Claims**



27. In a compressor of the type having at least one cylinder, a lubricant containing crankcase, a crankcase vent opening, and a drive pulley mounted on a shaft extending from said crankcase, said pulley having spokes disposed for creating an air flow toward said cylinder and crankcase and over said vent opening when driven to operate said compressor, crankcase

vent stack apparatus for exhausting said crankcase and comprising

a vent stack having a first open end adapted for fitting in said vent opening, a second open end, disposed within said air flow when said pulley is driven, a filter in said stack between said ends and a longitudinal axis,

said second open end being defined by first, second and third stack end edges,

said first stack end edges comprising two edge portions on opposite sides of said stack and lying in a plane parallel to the direction of said air flow, and normal to said axis,

said second stack end edges lying in a second plane intersecting said direction of air flow at one angle and said axis at an angle of other than 90°, and

said third stack end edges lying in a third and different plane intersecting said direction of air flow at one angle and said axis at an angle of other than 90°,

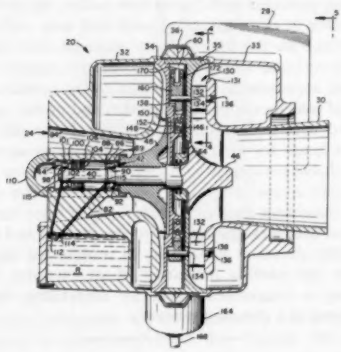
said first, second and third edges being connected to form an irregular opening.

4,179,247

TURBOCHARGER HAVING VARIABLE AREA TURBINE NOZZLES

Norbert L. Osborn, Irving, Tex., assignor to WRR Industries, Inc., Dallas, Tex.

Filed Jan. 14, 1977, Ser. No. 759,773
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—406 **22 Claims**



1. In combination with an internal combustion engine, a turbocharger comprising:

a shaft,

a turbine attached to one end of said shaft for receiving driving exhaust gases from said engine,

a compressor fitted on said shaft for rotation with said turbine, said compressor supplying air to the engine,

bearing means for rotatively supporting said shaft such that said compressor and turbine are overhung to one side of said bearing means such that said bearing means is removed from said turbine,

a plurality of nozzle vanes spaced about said turbine and in the inlet through which exhaust air from the engine is received to said turbine, and

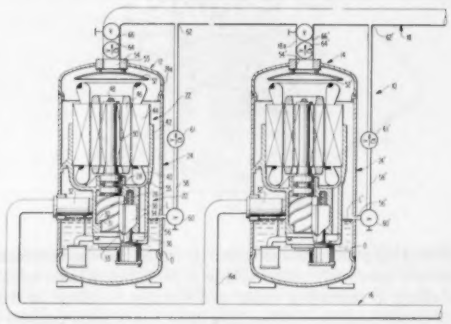
control means intermediate of said compressor and turbine for rotating said nozzle vanes to vary the flow of exhaust air to said turbine.

4,179,248

OIL EQUALIZATION SYSTEM FOR PARALLEL CONNECTED HERMETIC HELICAL SCREW COMPRESSOR UNITS

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Filed Aug. 2, 1978, Ser. No. 930,444
Int. Cl.[2] F04B *23/04, 39/02, 17/00*
U.S. Cl. 417—427 **4 Claims**



1. A compressed gas distribution system comprising; a plurality of hermetic, helical screw rotary compressors compressor units, said compressor units including a hermetic casing defining a sump for the accumulation of oil, intermeshed helical rotary screws and a compressor inlet and outlet, said gas distribution system further comprising a suction manifold and a discharge manifold, means for connecting the suction manifold to the compressor inlets of respective compressors, the compressor outlets opening to the interior of the compressor unit casing such that the lower portion of each casing defines a sump for the accumulation of oil within the casing interior at compressor discharge pressure, each casing being provided with an outlet port well above the level of accumulated oil and opening to the discharge manifold such that the compressor units are connected in parallel, the improvement comprising; an oil bleed port within each casing at the normal level of accumulated oil and a small diameter oil bleed line connecting the oil bleed port to the discharge manifold at a point downstream of the hermetic compressor casing outlet port connection to the discharge manifold for respective compressor units whereby, the compressor discharge pressure within the casings causes excessive oil accumulating within a given casing to flow through the small diameter oil line of that compressor casing to the discharge manifold for redistribution to the remaining compressors to equalize the amount of oil within each compressor unit.

4,179,249

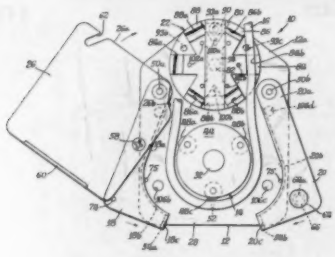
QUICK LOADING PERISTALTIC PUMP

Emil J. Guttmann, Morton Grove, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.

Filed Dec. 7, 1977, Ser. No. 858,270
Int. Cl.[2] F04B *43/12, 45/08*
U.S. Cl. 417—477 **18 Claims**

1. A peristaltic pump comprising a base plate defining a generally planar mounting surface, a rotor rotatably supported by said base plate for rotation about an axis substantially perpendicular to said mounting surface, said rotor including at least one compression surface movable in a plane substantially parallel to said mounting surface, a pair of reaction members pivotally supported by said base plate for movement relative to said base plate between closed positions juxtaposed to said rotor and open positions spaced from said rotor, said reaction members defining cam surface means operative when said reaction members are in their said closed positions to maintain

a compressible fluid flow tube in position to be engaged by said compression surface upon rotation of said rotor so as to effect a peristaltic pumping action on said tube, said reaction members facilitating loading and removal of said tube relative to said rotor when in their said open positions and exposing an outer surface of said rotor when in their said closed positions,



and locking plate means mounted on one of said reaction members and selectively cooperable with the other of said reaction members to releasably retain said reaction members in their said closed positions, said locking plate means being adapted to cover said exposed outer surface of said rotor when in said retaining relation with said reaction members so as to prevent access to said rotor.

4,179,250

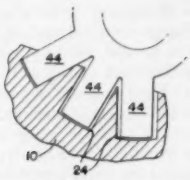
THREAD CONSTRUCTION FOR ROTARY WORM COMPRESSION-EXPANSION MACHINES

Ghanshyam C. Patel, Franklin, Pa., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,591

Int. Cl.[2] F01C *1/08*; F04C *17/04*

U.S. Cl. 418—195 **8 Claims**



1. In a rotary worm compression-expansion machine having a rotor supported in a casing for rotation on a first axis, the rotor having a plurality of spirally extending threads to establish correspondingly spiral grooves having opposite high and low pressure ends, each having a root surface lying between a pair of side surfaces at the low pressure end and extending toward the opposite high pressure end, the casing having an inner surface portion defining with the spiral grooves a plurality of compression-expansion chambers, and at least one rotary pinion wheel supported rotatably in the casing on a second axis tangential to the rotor and having radiating teeth projecting through the inner casing surface into the grooves so that rotation of the rotor and pinion wheel effects relative travel of each tooth between the high and low pressure ends of each groove to vary the volume of the compression-expansion chambers in the performance of a fluid working operation, the improvement comprising: means defining each groove with a cross-sectional size at the low pressure end thereof larger than the effective size of each pinion wheel tooth, the cross-sectional size of each groove being progressively reduced toward the high pressure end thereof to effect sealing contact between the groove surfaces and each pinion wheel tooth as each tooth moves relative to the rotor in the region of the high pressure end portion of each groove.

4,179,251

MULTIPLE EXTRUSION HEAD EXTRUSION BLOW MOULDING APPARATUS

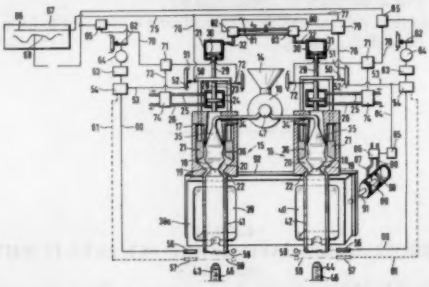
Dieter Hess, Swistal-Morenhoven; Carsten Friedrichs, Bad Honnef, and Werner Daubenbüchel, Bensberg-Refrath, all of Fed. Rep. of Germany, assignors to Kautex-Werke Reinold Hagen GmbH, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 753,152

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558780

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—140 **12 Claims**



1. Multiple extrusion head extrusion blow moulding apparatus comprising a plurality of extrusion heads for forming parisons of a thermoplastic material to be blown, each extrusion head being provided with: (a) an inlet orifice, (b) an accumulator chamber in communication with said inlet orifice, (c) an outlet orifice for the thermoplastic material, and (d) a piston slidably positioned within said accumulator chamber for emptying said accumulator through said outlet orifice to form a parison of said thermoplastic material, and means operatively associated with said pistons for driving all the pistons of all extrusion heads for identical and simultaneous movement in respect of position and/or speed during their parison-extruding strokes, said means comprising a plurality of drive means and position indicators, each of said plurality of drive means being associated with a respective one of the pistons, and wherein a comparator device is connected to receive the signals triggered by the position indicators of all extrusion heads for generating a comparison signal for controlling the various drive means in a common manner.

4,179,252

APPARATUS FOR FORMING FLEXIBLE FOLD LINES IN THERMOPLASTIC SHEETS AND ARTICLE SO FORMED

Gerhard Seufert, Otto-Hahn-Strasse 3, 6051 Hainhausen, Fed. Rep. of Germany

Division of Ser. No. 653,053, Jan. 28, 1976, Pat. No. 4,064,206. This application Sep. 6, 1977, Ser. No. 830,536

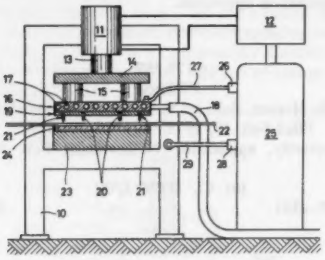
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541324

Int. Cl.[2] B29C *17/00*

U.S. Cl. 425—174.6 **5 Claims**

1. An apparatus for the production of container blanks by forming flexible fold lines in a thermoplastic sheet comprising a rule-shaped forming tool and a substantially flat surface for supporting said sheet, means for cooling said tool, means for moving said tool toward said substantially flat surface, means for electrically insulating said cooling means from said moving means, and means for creating a high frequency electric field

between said tool and said substantially flat surface whereby the temperature applied to the surface of said sheet adjacent



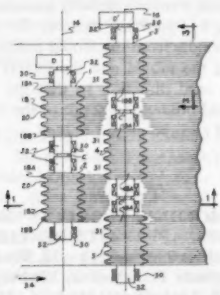
said tool is less than the temperature applied in the middle of said sheet in an area adjacent said tool.

4,179,253

LINEAR CORRUGATING ROLL DEFLECTION CONTROL

Herbert D. Lightfoot, Montreal, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Apr. 10, 1978, Ser. No. 895,160
Int. Cl.[2] B29D *7/14*
U.S. Cl. 425—369 **4 Claims**



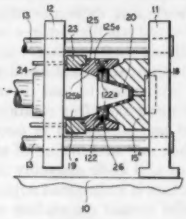
1. A linear corrugator for simultaneously corrugating and consolidating a non-consolidated dry formed fibrous web comprising; means to advance said web in a direction, a first consolidating press means and a second consolidating press means, said second press means being spaced from said first press means in said direction, each of said press means being formed by a pair of mating rolls having their rotational axes perpendicular to said direction, each said roll having a plurality of circumferentially extending ridges and grooves adapted to mate with similar ridges and grooves in the mating roll thereby to simulataneously corrugate and consolidate said dry formed web; said first press means providing a first consolidating pressure nip and said second press means providing a second consolidating pressure nip; said first and said second nips being axially offset in the direction of said rotational axes of said rolls to corrugate and consolidate substantially only discrete areas of said web, said second nip being positioned to at most corrugated and consolidate only a portion of the web corrugated and consolidated by said first nip, the longitudinal length of each of said nip in the direction of said axes of rotation being between 5 and 36".

4,179,254

INJECTION MOLD WITH FLOATING STRIPPER RING

Paul Brown, Orangeville, Canada, assignor to Husky Injection Molding Systems Inc., Bolton, Canada

Filed Sep. 26, 1978, Ser. No. 945,901
Int. Cl.[2] B29C *7/00*; B29F *3/00*
U.S. Cl. 425—438 **11 Claims**



1. In an injection-molding machine provided with two relatively movable platens interconnected by tie bars, a male mold portion on one of said platens, a female mold portion on the other of said platens having a cavity enterable in a mold-closed position by a core projecting from said male mold portion, and a stripper ring surrounding said core for dislodging a molded article therefrom in a mold-open position,

the combination therewith of:

a stripper plate supported on said tie bars between said platens for movement parallel to said tie bars in said mold-open position; and

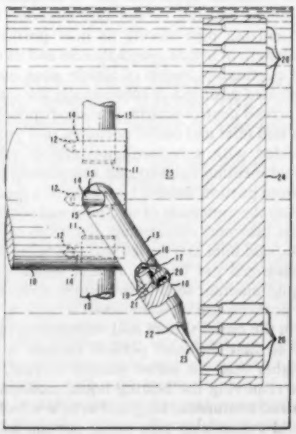
a locking ring provided with inner centering surfaces engaging respective outer centering surfaces of said mold portions in said mold-closed position for maintaining said mold portions in mutual alignment, said stripper ring being seated in said locking ring between said inner centering surfaces thereof, said locking ring being mounted on said stripper plate for entrainment thereby in said mold-open position.

4,179,255

MELT CUTTER APPARATUS

Alan D. Hale, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 13, 1978, Ser. No. 886,262
Int. Cl.[2] B29C *17/14*
U.S. Cl. 425—67 **12 Claims**



1. An improved rotary melt cutter apparatus for producing

pellets from at least one strand of a partly molten thermosplastic resin in cooperation with a die, said die having a die surface with at least one orifice, said improved rotary melt cutter apparatus adapted to be driven rotationally by a rotating shaft structure, said apparatus comprising rotating knife assembly and means connecting said assembly to said rotating shaft structure, said rotating knife assembly comprising a drive rod connected to said shaft structure, a knife holder and attached thereto an approximately center-supported knife, said drive rod cooperating with said knife assembly connecting means such that said drive rod has limited free rotation about its axis running to said rotating shaft structure, said knife holder being connected to said drive rod, said knife holder being axially aligned with and connected to said drive rod such that said knife holder has limited axial free rotation, said rotating knife assembly mounted and supported in cooperative association with said die surface and said orifice of said die such that the plane of rotation of said knife assembly about the axis of said rotating shaft structure is maintained adjacent and in alignment substantially parallel to said die surface and said orifice such that only a limited amount of wear of both the knife and the die occurs during operation, and means for advancing said rotating knife assembly toward said die surface and said extrusion orifice.

4,179,256

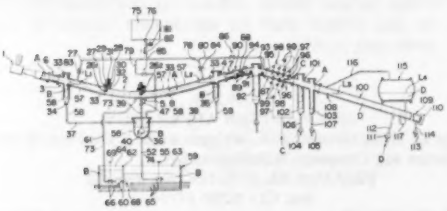
VULCANIZATION APPARATUS FOR A CONTINUOUS LENGTH OF ARTICLE OF RUBBER, PLASTICS OR THE LIKE MATERIAL

Shoji Tomioka; Toshiaki Nakao; Hisatsugu Nakamura, all of Kitakyushu; Nobuyoshi Mine, Fukuoka; Katsuo Yamamoto, Ichihara; Seiji Fukushima, Ichihara, and Akira Nogami, Ichihara, all of Japan, assignors to Furukawa Electric Co., Ltd., Marunouchi, Japan

Filed Aug. 15, 1978, Ser. No. 933,872

Int. Cl.[2] B29H *5/28*; B29C *25/00*

U.S. Cl. 425—71 **16 Claims**



1. A vulcanization apparatus for a continuous length of article of rubber, plastics or the like material, comprising a curved vulcanizing pipe having its inlet portion where said continuous length of article enters therein and its outlet portion where said continuous length of article goes out thereof disposed at elevated positions of substantially the same height and having its curved central bottom portion disposed at a position lower than said inlet and outlet portions, said vulcanizing pipe being provided with a recirculation system which causes a heating liquid medium fed into said vulcanizing pipe from said curved bottom portion thereof by means of a feeding device to flow out from the underside of said inlet and outlet portions for recirculation into said vulcanizing pipe from said curved bottom portion, said inlet and outlet portions being each provided with a pressurized gas feeding system which pressurizes the heating liquid medium so that the liquid surfaces at said inlet and outlet portions are on same level, a cooling pipe which is provided on the outlet side of said vulcanizing pipe and which is inclined so that the inlet portion thereof is disposed at a position higher than the outlet portion thereof, and a tubular cleaner for removing the heating liquid medium deposited on the vulcanized continuous length of article which is interposed between said vulcanizing pipe outlet portion and said cooling pipe inlet portion that are both at elevated positions as compared with the position of said outlet portion of said cooling pipe, said vulcanizing pipe, tubular cleaner and cooling pipe being coupled from one to another in this sequence to form the entire vulcanization apparatus.

4,179,257

PRESS

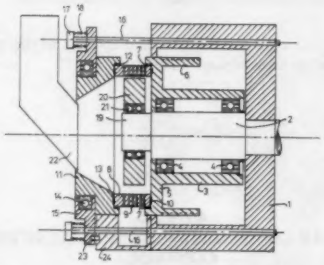
Theodorus J. Heesen, Selissen 6, Boxtel, Netherlands

Filed Feb. 10, 1978, Ser. No. 876,943

Claims priority, application Netherlands, Feb. 11, 1977, 7701448

Int. Cl.[2] B29C *3/00*

U.S. Cl. 425—331 **10 Claims**



1. A press for compressing powdery material into granular material, comprising a rotatable, annular, perforated mould, a drivable mould holder supporting said mould, a stationary shaft located within said mould eccentrically of the longitudinal axis of said mould, a roller rotatably mounted on said shaft within said mould, a supporting member for supporting the side of the mould remote from the mould holder, said supporting member urging the mould and the mould holder against one another in an axial direction so that the mould will be rotated by the mould holder as a result of the frictional forces between the mould and the mould holder.

4,179,258

METHOD OF MOLDING PRODUCTS FROM MOIST MATERIALS AND APPARATUS REALIZING SAME

Genrikh E. Karas, ulitsa 8 Marta, 3, kv. 12, Semiluki Voronezhskoi oblasti; Ljudmila P. Lebedeva, Vitebsky prospekt, 53, korpus, 2, kv. 54, Leningrad; Anatoly A. Mukhin, ulitsa 8 Marta, 7, kv. 12; Anatoly D. Pivovarov, ulitsa 9 Yanvarya, 5, kv. 7, both of Semiluki Voronezhskoi oblasti; Vladimir I. Skrynnikov, ulitsa Leni Golikova, 84, kv. 17, Leningrad; Vladimir M. Yam, ulitsa Vernosti, 13, kv. 152, Leningrad; Vladimir T. Oleinik, 8 Sovetskaya ulitsa, 38, kv. 3, Leningrad; Vladimir V. Miroshnichenko, Drovyanoi pereulok, 4, kv. 9, Leningrad, all of U.S.S.R.; Vasily A. Kovtun, deceased, late of Semiluki Voronezhskoi oblasti, U.S.S.R.; by Lidia P. Kovtun, administrator, ulitsa 8 Marta, 7. kv. 19, Semiluki Voronezhskoi oblasti, U.S.S.R.; by Inna V. Soshnikova, administrator, ulitsa 8 Marta, 7, kv. 19, Semiluki Voronezhskoi oblasti, U.S.S.R., and by Sergei V. Kovtun, administrator, ulitsa 8 Marta, 7, kv. 19, Semiluki Voronesbakoi oblasti, U.S.S.R.

Division of Ser. No. 760,436, Jan. 13, 1977, Pat. No. 4,140,744, which is a continuation of Ser. No. 529,531, Dec. 4, 1974, abandoned. This application Sep. 26, 1978, Ser. No. 945,911

Int. Cl.[2] B28B *1/08*

U.S. Cl. 425—352 **1 Claim**

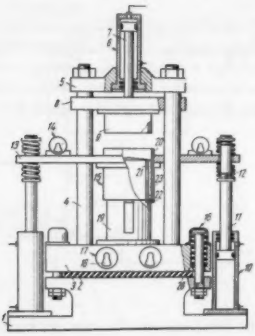
1. An apparatus for molding products from moist bulk materials comprising:

a base;

an elastic padding mounted on said base;

a vibrating frame resting on said elastic padding;

a fastening means for fastening said vibrating frame to said base;
columns secured on said vibrating frame;
a stationary crosshead interconnecting said columns in the upper portion thereof;
a power cylinder comprising a rod and a piston mounted on said stationary crosshead, said rod extending beyond said stationary crosshead in a downwardly direction;
a mobile crosshead attached to said rod of said power cylinder guided by said columns;
an upper punch secured to said mobile crosshead;



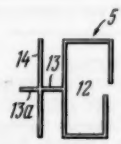
a lower punch secured on said vibrating frame;
further power cylinders comprising further rods and further pistons being mounted on said base;
an additional crosshead mounted on said further rods and adapted to reciprocate and be guided along said columns;
vibrations exciters mounted on said vibrating frame and said additional crosshead;
a power means for powering said vibration exciters; and
a mold case mounted on said additional crosshead, said mold case, said upper punch, and said lower punch being arranged collinearly.

4,179,259

SPINNERET FOR THE PRODUCTION OF WOOL-LIKE MAN-MADE FILAMENT

Mikhail N. Belitsin, 2 Donskoi proezd, 6, kv. 9, Moscow; Sergei A. Kudryashov, ulitsa Mira, 16, kv. 33, Klin Moskovskoi oblasti; Alexandr G. Borik, Borodinsky prospekt, 7, kv. 27, Klin Moskovskoi oblasti; Valentin V. Kulikov, Leningradskoe shosse, 44, kv. 58, Klin Moskovskoi oblasti; Natalia A. Sadkova, ulitsa Oxkaya, 22/2, kv. 13, Moscow; Galina A. Kudryashova, ulitsa Mira, 16, kv. 33, and Leonid F. Vorontsov, ulitsa Gagarina, 45, kv. 8, both of Klin Moskovskoi oblasti, all of U.S.S.R.

Filed Sep. 20, 1977, Ser. No. 835,221
Int. Cl.[2] D01D *3/00*
U.S. Cl. 425—461 **7 Claims**



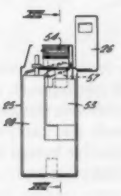
1. A spinneret for obtaining a chemical filament having a cross-section defining a first ring shaped portion and a second rectilinearly shaped portion integral therewith, comprising: a dope spinning hole shaped as a slot, the configuration of the slot defining an open polygon comprising means for forming said first ring shaped portion of said filament; means defining a first rectilinear portion adjoining at least one of the sides of the polygon at a right angle thereto; means defining at least one more slot shaped as a rectilinear section intersecting said first rectilinear portion at a right angle thereto, whereby a cross-shaped slot is formed by the first rectilinear portion and the rectilinear section.

4,179,260

SMOKERS' LIGHTER

Hans Lowenthal, London, England, assignor to Colibri Lighters Limited, England

Filed May 10, 1977, Ser. No. 795,493
Claims priority, application United Kingdom, May 11, 1976, 19406/76
Int. Cl.[2] F23Q *7/12*
U.S. Cl. 431—255 **18 Claims**



1. A smokers' lighter of the boxtype comprising: a substantially rectangular casing of elongate horizontal cross section having a pair of narrower opposed ends separated by a pair of relatively broader sides with an upper part of said casing constituted by a lid; means connecting said lid to said casing whereby said lid may be swung upwards generally adjacent to one narrower end thereof; a fuel reservoir tank having a burner at the upper end thereof and mounted within said casing adjacent to the other narrower end of said casing remote from said one end about which said lid swings upwards whereby said burner is exposed for use upon upward swinging of said lid; and a piezoelectric spark generating unit having a depressible actuating plunger at the upper end thereof and mounted side by side with said fuel reservoir tank within said casing and adjacent to said one narrower end of said casing about which said lid swings upwards, said actuating plunger being mounted to be depressed by an operator's thumb applied at one broader side of said casing and having an indentation in its side so shaped as to make engagement with the operator's thumb when pressed thereagainst and drawn down said one broader side of said casing to thereby operate said spark generating unit and being mounted such that at least that part thereof which must be contacted by the operator to depress said plunger becomes exposed for use only upon raising of said lid.

4,179,261

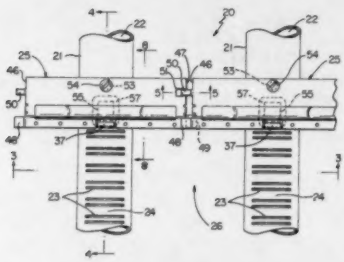
BURNER CONSTRUCTION AND PARTS THEREFOR AND METHODS OF MAKING THE SAME

Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 15, 1977, Ser. No. 824,482
Int. Cl.[2] F23D *13/36*
U.S. Cl. 431—286 **24 Claims**

1. In a burner construction having a plurality of burners disposed in a spaced arrangement thereof and each having port means for issuing fuel to be ignited, said construction having a plurality of ignition carry-over units respectively carried by said burners and each being adapted to receive fuel from its respective burner and issue the same out of an ignition slot means thereof that bridges part of the spacing between said burners adjacent thereto, each said carry-over unit having joining mens joining with said joining means of an adjacent carry-over unit in such a manner that said joined joining means causes said ignition slot means thereof to be continuous be-

tween adjacent joined carry-over units, each said carry-over unit having opposed ends, the improvement wherein said joining means of each said carry-over unit comprises a pair of tabs respectively disposed at said opposed ends thereof, said pair of tabs for each said carry-over unit being disposed in



planes offset relative to each other whereby adjacent tabs of adjacent carry-over units overlap each other in spaced relation to define part of said continuous slot means between said adjacent carry-over units, each said carry-over unit having hook means hooking to its respective burner to tend to hold the same together in their assembled relation.

4,179,262

GAS-HEATING APPLIANCE

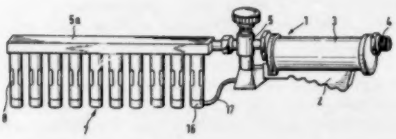
Volker Wardt, Muhlenweg 3a, Kleve Nutterden, Brd., and Heinz L. Gantevoort, Gruner Weg 4-6, Goch 5, Brd., Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,232

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1976, 2645263

Int. Cl.[2] F23D *13/40*

U.S. Cl. 431—354 **3 Claims**



1. A gas heating applicance comprising a gripping and operating handle, a gas feed pipe extending from said handle, means associated with said handle for supplying said feed pipe with a controlled flow of fuel and a plurality of gas burners disposed side by side along the length of said feed pipe, each burner comprising a gas jet communicating with said feed pipe, a mixer pipe having one end surrounding said gas jet, said mixer pipe defining lateral holes for the admission of combustion air from the atmosphere, a burner nozzle means at the other end of said mixer pipe and a pair of part-cylindrical baffle walls forming an extension of said mixer pipe beyond said nozzle means, said baffle walls defining a pair of spacer gaps therebetween and wherein the spacer gaps of the respective burners are in mutual alignment, each burner nozzle means comprising an annular disc with a central hole, said central hole being surrounded by outwardly directed jets extending radially obliquely through the annular disc, and wherein the individual cross sectional area of the jets as well as the total cross sectional areas of the jets is small as compared with the central hole in the disc.

4,179,263

PROCESS FOR THE UTILIZATION OF WASTE SUBSTANCES AND DEVICE FOR CARRYING OUT THE PROCESS

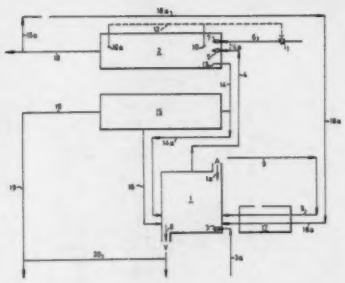
Fritz Jung, Vienna, and Ludwig Kwech, Kaltenleutgeben, both of Austria, assignors to Perlmooser Zementwerke Aktiengesellschaft, Vienna, Austria

Filed Oct. 28, 1977, Ser. No. 846,340

Claims priority, application Austria, Oct. 29, 1976, 8077/76

Int. Cl.[2] F24J *3/00*

U.S. Cl. 432—1 **20 Claims**



1. Apparatus for carrying out the process for the utilization of waste substances containing combustible components and showing fluctuations in their composition and properties, in their water content, in their content of components undergoing endothermic reactions at heating or in their calorific value, said process comprising subjecting the waste substances to decomposition under liberation of their volatile components by means of incomplete combustion and of burning the gases thus formed, comprising a first heating means for volatilizing, decomposing and incompletely burning the waste substances to produce pyrolysis gases and a second heating means to burn the pyrolysis gases immediately after they are produced.

4,179,264

METHOD FOR EXPANDING PERLITE

Gerard R. Vancauwenberghe, St. Denijs Westrem, Belgium, assignor to Dicalite Europe Nord, S.A., Brussels, Belgium

Filed Nov. 8, 1977, Ser. No. 849,592

Claims priority, application Belgium, Nov. 9, 1976, 0172205

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—13 **7 Claims**

1. A method of expanding unexpanded particulate perlite, comprising the steps of:

(a) mixing said particulate perlite with a combustible gas, air and oxygen, wherein the amount of combustible gas in the mixture is on the order of 1 volume of combustible gas for 2 to 6 volumes of air and said oxygen is introduced to said mixture in an amount comprising 1.5 to 16 weight percent of said air in said mixture; and

(b) effecting combustion of said combustible gas to expand substantially all of said particulate perlite.

4,179,265

METHOD AND APPARATUS FOR OPERATING ROTARY DRIERS

Hayden P. Gildersleeve, Colorado Springs, Colo., assignor to Holly Sugar Corporation, Colorado Springs, Colo.

Filed Oct. 17, 1977, Ser. No. 842,397

Int. Cl.[2] F27B *7/20;* **F27D** *19/00*

U.S. Cl. 432—36 **21 Claims**

1. A method of controlling the operation of a drier having an induced draft, elongated rotating drum supplied with heated gases, a product to be dried being supplied to the intake end of the drum and moved to the discharge end of the drum generally by said gases, said method comprising:

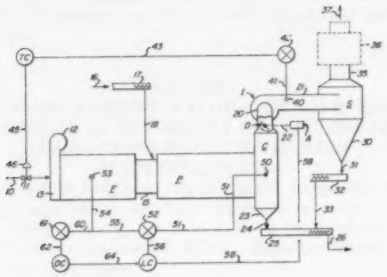
determining the pressure of gases supplied to said drum;

determining the pressure of gases discharging from said drum;

determining the differential in pressure between the pressure of the supply gases and the discharge gases; supplying the determination of the differential in pressure to a control device and

controlling, through said control device, the induced draft of said drum by variations in said pressure differential by decreasing said draft upon an increase in said differential pressure and increasing said draft upon a decrease in said differential pressure.

12. Apparatus for controlling the operation of a drier having an induced draft, elongated rotating drum supplied with heated gases, wherein a product to be dried is supplied to the intake end of the drum and moved to the discharge end of the drum generally by said gases, wherein said heated gases are supplied



by a fuel burning furnace and wherein the pressure in said furnace corresponds to the pressure of heated gases supplied to said drum, said apparatus including:

means for determining the pressure of gases supplied to said drum;

means for determining the pressure of gases discharging from said drum;

means for determining the differential in pressure between the pressure of the supply gases and the discharge gases;

means for controlling the induced draft for said drum by variations in said pressure differential by decreasing said draft upon an increase in said differential pressure and increasing said draft upon a decrease in said differential pressure; and

means for overriding the control of said induced draft to restrain further reduction in said draft when the pressure in said furnace increases to approach atmospheric within a predetermined amount.

4,179,266

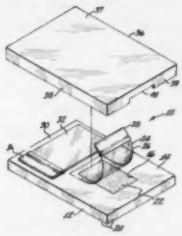
METHOD AND APPARATUS FOR CULTURING AND EXAMINING FUNGI

Patricia A. Lukacsek, 4014 W. Navajo Dr., Phoenix, Ariz. 85021

Continuation-in-part of Ser. No. 789,773, Apr. 22, 1977, abandoned. This application Oct. 27, 1977, Ser. No. 845,897

Int. Cl.[2] **C12B** *1/00*

U.S. Cl. 435—254 **4 Claims**



1. A method for culturing fungi preparatory to microscopic examination thereof, said method comprising:

(a) removing a cover from a base to expose a planar top surface thereof, said cover and said base formed of optically clear material;

(b) removing a sealing membrane from said planar top surface to expose a culture nutrient medium in jelled form contained within a compartment of said base, said compartment opening upwardly onto and surrounded by said planar top surface and said jelled culture nutrient medium disposed in said compartment to be flush with said planar top surface;

(c) inoculating a fungi into said culture nutrient medium;

(d) placing a cover slip atop said jelled culture nutrient medium after inoculation of said medium, said cover slip resting on said planar top surface to sealingly cover said compartment and to be in contiguous engagement with said jelled culture nutrient medium;

(e) replacing said cover on said base to hold said cover slip in place and to enclose said base; and

(f) incubating the fungi inoculated into said culture nutrient medium for development of fungal growth on said culture nutrient medium and on the downwardly facing surface of said cover slip to complete preparation thereof for microscopic examination.

4,179,267

STABLE, HIGHLY CONCENTRATED DYESTUFF SOLUTIONS MISCIBLE WITH WATER IN ANY PROPORTION

Roger Lacroix, Huningue, France, and Hans Mollet, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 377,881, Jul. 9, 1973, abandoned. This application Mar. 3, 1976, Ser. No. 663,419

Claims priority, application Switzerland, Jul. 14, 1972, 10605/72; Jun. 7, 1973, 8257/73

Int. Cl.[2] C09B *5/62;* D06P *1/02*

U.S. Cl. 8—41 R 7 Claims

1. A stable water-miscible dyestuff solution containing 10–60% by weight of a non-metallized dyestuff, containing a sulfonic acid group and selected from the group consisting of an azo dyestuff and a nitro dyestuff, dissolved in a mixed solvent consisting of an aprotic solvent or a mixture of aprotic solvents selected from the group consisting of dimethylsulfoxide, N-methylpyrrolidone and tetramethylurea each of said aprotic solvent or mixture of said solvents "being mixed with" together with a water-miscible glycol or glycol ether and 0 to 50% water.

4,179,268

METHOD OF MACHINE WASHING OF SOLID SOILED MATERIALS BY REVERSIBLY CONTACTING THE CIRCULATING WASH LIQUID WITH ALUMINOSILICATES

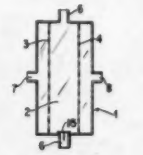
Elmar Reinwald, Dusseldorf; Heinz Smolka, Langenfeld; Milan J. Schwuger, Haan, and Edgar Koppelmann, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

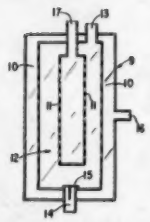
Filed Nov. 16, 1977, Ser. No. 852,028

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1976, 2653479

Int. Cl.[2] B08B *3/00;* C02B *1/00*

U.S. Cl. 8—137 12 Claims





1. A method for machine washing and cleaning of solid materials utilizing washing and cleaning solutions in the presence of water-insoluble cation exchange agents which are capable of binding the hardness components of the water and the soil, comprising withdrawing and recycling the wash liquid in contact with said solid soiled materials through a silicate cation exchange compound having some combined water and a particle size of between 10μ and 1000μ of the formula:

$$(M_{2/n}O)_x.Me_2O_3.(SiO_2)_y$$

wherein M is a cation of valence n exchangeable with calcium, Me is a member selected from aluminum and boron, x is a number from 0.7 to 1.5 and y is a number from 0.8 to 6, said agent having a calcium binding power of at least 50 mg of CaO per gram, said silicate cation exchange compound being maintained completely out of contact with said solid soiled materials in a separate area from the washing area, said wash liquor at some time during said recycling containing soluble washing and cleaning compounds and washing said solid materials while continuing the recycling of the wash liquor through said silicate cation exchange compound, wherein the total amount of washing liquor is continuously or intermittently cyclically circulated from the washing area through the separate area with the cation exchange compound and then back to the washing area at least five times during the cleaning process, and during this period the direction of flow of said wash liquor through said silicate compound is reversed repeatedly, and where the amount of the cation exchange compound is 0.2 gm to 10 gm per liter of washing solution, and said washing solution contains from 0.2 to 10 gm per liter of other soluble washing and cleaning compounds, whereby said silicate cation exchange compound is never in contact with said solid materials.

4,179,269

SYNTHETIC LOG PRODUCTION

Willard L. Yates, Rte. 1, Box 326 A, Parker City, Ind. 47368, and Floyd W. Lee, Penz Dr., Oakwook, Ill. 61858

Filed Apr. 12, 1978, Ser. No. 896,023

Int. Cl.[2] C10L *5/00*

U.S. Cl. 44—10 B 21 Claims

1. A method of making fireplace logs or the like comprising the steps of

mixing a major portion of ground coal and a minor portion of relatively fine wood fiber material,

heating a minor portion of slack wax to its melting temperature,

mixing the minor portion of melted wax with the major portion of ground coal and the minor portion of wood fiber material so that a putty-like, extrudable mixture is formed, and

extruding the putty-like mixture to produce cylindrical logs or the like.

12. A cylindrical fireplace log or the like consisting of

a major portion of ground coal,

a minor portion of relatively fine wood fiber material,

a minor portion of slack wax, and

a flame coloring agent.

4,179,270

AID FOR KINDLING FIRES

William J. Clayton, Fairport, and Donald F. Kutniewski, Macedon, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,340

Int. Cl.[2] C10L *11/00*

U.S. Cl. 44—40 9 Claims

1. A fire kindling aid comprising:

(a) a substantially solid composition comprised of about 50 to about 90 percent by weight of wax and about 10 to about 50 percent by weight of cellulosic particles, based on the total weight of said composition;

(b) one or more layers of absorbant flammable material adjacent to said composition; and

(c) a container enclosing said composition and said absorbant material, said container comprising a flammable, oil impervious packaging material.

4,179,271

AMINE OXIDE POLYMERS AND USE THEREOF AS FUEL DETERGENT

Paul F. Vartanian, Wappingers Falls, and Anthony L. Ippolito, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,547
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—62 4 Claims

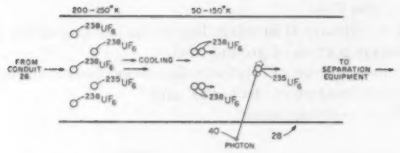
1. A motor fuel composition comprising a gasoline base fuel and from 0.005 to 1 weight percent of a detergent reaction product where said detergent reaction product is obtained by preparing an initial reaction mixture consisting of from 5 to 30 weight percent of a butyl methacrylate, 50 to 81 weight percent of a higher ester of methacrylic acid consisting of between 10 and 25% by weight of C_{16}–C_{20} esters of methacrylic acid and 40 to 60 weight percent of a C_{12}–C_{15} aliphatic ester of methacrylic acid, from 4 to 20 weight percent of a nitrogen containing compound selected from the group consisting of 4-vinyl-pyridine and dimethylaminoethyl methacrylate and reacting said initial mixture in the presence of a polymerization catalyst and polymerization initiator to produce a first reaction product, admixing said first reaction product with an oxidizing agent selected from the group consisting of hydrogen peroxide, potassium permanganate, acetic acid, C_2–C_8 alkenyl peracid and C_1–C_8 alkyl peracid to form a second reaction mixture and reacting said second reaction mixture at a temperature ranging from 50° to 200° C. to form said detergent reaction product.

4,179,272

LASER ISOTOPE SEPARATION USING SELECTIVE INHIBITION AND ENCOURAGEMENT OF DIMER FORMATION

Bennett Kivel, Melrose, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Aug. 1, 1977, Ser. No. 820,621
Int. Cl.[2] B01J *1/10;* B01D *1/00*
U.S. Cl. 55—1 59 Claims



1. A method for producing mass dependent isotopic separation among molecules having an atom present in plural isotope types, the method comprising the steps of:

establishing a flowing environment of the molecules having an atom thereof present in several isotope types;

inducing isotopically selective vibrational excitation of the molecules of said flowing environment so as to produce molecular vibration of molecules having an atom of a predetermined isotope type without correspondingly inducing vibration of molecules having an atom of another isotope type;

inducing aggregation of the flowing molecules having atoms of an isotope other than the predetermined isotope type to form clusters of such molecules while substantially avoiding the formation of dimers and larger clusters of molecules having an atom of the predetermined vibrationally excited isotope type, whereby the selectively excited molecules predominate in monomers; and

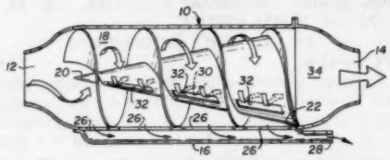
separating the selectively excited monomers from the flowing environment of molecules.

4,179,273

DUAL SCAVENGING SEPARATOR

Robert R. Montusi, East Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,259
Int. Cl.[2] B01D *45/16*
U.S. Cl. 55—457 15 Claims



1. A means to separate contaminants from pressure fluid flow while simultaneously scavenging clean fluid from said fluid flow, said means comprising:

an annular housing having a fluid inlet at one end and open at the other, said housing having openings in a wall thereof extending from adjacent the inlet to the other end;

a cone insert for said housing for closing said open end, said cone insert having a spiralling baffle thereabout supporting it in said housing, openings through the cone insert communicating the annular housing to the interior of the cone insert, and a fluid outlet for the interior of the cone insert; and

a sump connected to said annular housing to underlie said openings in the wall thereof, said sump being purged by pressure fluid flow from said annular housing.

4,179,274

RESPIRATOR FILTER AND METHOD OF MAKING THE SAME

William F. Moon, 310 W. Front St., Buchanan, Mich. 49107

Filed Jan. 7, 1976, Ser. No. 647,113
Int. Cl.[2] B01D *39/14*
U.S. Cl. 55—524 4 Claims

1. In a filter for use at the intake opening of a respirator comprising a felted body of fibers impregnated with a rosin which is uniformly fractured, the improvement wherein said body is characterized by a surface at which the ends of fibers are loose and fluffed and extend outwardly from the body to provide a fluffed or lofted substantially uniform surface texture, said body being of substantially uniform thickness throughout.

4,179,275
METHOD OF EXPANDING METALLURGICAL SLAG

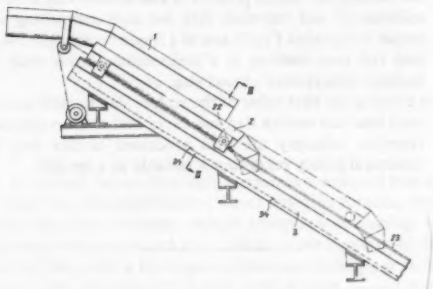
Paul Metz, Luxembourg; Robert Schockmel, Esch-sur-Alzette, and Roland Mersch, Dudelange, all of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed, Luxembourg, Luxembourg

Division of Ser. No. 851,636, Nov. 15, 1977, Pat. No. 4,123,247. This application May 15, 1978, Ser. No. 906,110

Claims priority, application Luxembourg, Nov. 17, 1976, 76218; Sep. 26, 1977, 78186

Int. Cl. C03B *19/08*

U.S. Cl. 65—20 **2 Claims**



1. In a method of expanding metallurgical molten slag wherein the molten slag is passed downwardly along a pre-expanding path and is contacted with a film of an expanding agent, and the pre-expended slag at the end of said path is further expanded, the improvement which comprises the steps of varying the position at which molten slag is delivered to said path in accordance with the temperature and viscosity thereof so that poorer-foaming slags at lower temperature traverse a longer pre-foaming path, maintaining a constant inclination of said path along its length, and varying lengths of paths for slags of different physical characteristics are varied so that the pre-foamed slag subjected to further expansion for all of the slags has essentially the same characteristics, the length of the path being varied by shifting an intermediate trough relative to a fixed upper trough and a fixed lower trough parallel to the lower trough, the upper trough dispensing a flow of molten slag and the intermediate trough underlying said upper trough and having a discharge edge shiftable along the lower trough.

4,179,276
NOVEL IMIDAZOTHIAZINE-1,3 (2H)-DIONES

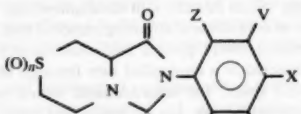
Jiin-Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 764,582, Feb. 1, 1977, abandoned. This application Mar. 27, 1978, Ser. No. 890,295

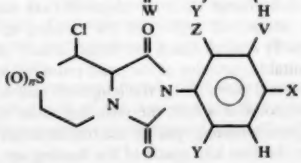
Int. Cl.[2] **C07D** *53/04;* **A01N** *9/12, 9/14*

U.S. Cl. 71—91 **51 Claims**

1. A compound of the formula:



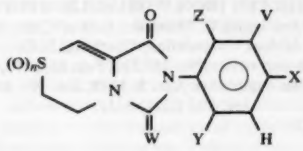
Ia



Ib

-continued

or



Ic

where

n is 0, 1 or 2;

W is oxygen or sulfur;

X is hydrogen, fluorine, chlorine, bromine, cyano, methyl, methoxy or nitro;

Y is hydrogen, fluorine, chlorine or methyl;

Z is hydrogen, fluorine or methyl;

V is hydrogen, fluorine, chlorine or OR; and

R is propargyl or alkyl of 1 to 4 carbon atoms with the proviso that (1) X, Y, Z and V cannot all be hydrogen when n is 0 and W is oxygen; and (2) when V is other than H at least one of X, Y and Z must be other than H; and (3) n is 0 when W is sulfur, for compounds of Formula Ic.

18. A composition for the control of undesirable vegetation consisting essentially of a compound of Formula Ia, Ib or Ic of claim **1** and at least one of (a) a surface active agent and (b) a solid or liquid diluent.

4,179,277
4,5-DICHLOROIMIDAZOLE-2-CARBOXYLIC ACID DERIVATIVES

Gunther Beck, Leverkusen; Klaus Sasse, Schildgen; Helmut Heitzer; Ludwig Eue, both of Leverkusen; Robert R. Schmidt, Cologne; Hans Scheinpflug, Leverkusen; Ingeborg Hammann, and Wilhelm Brandes, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 18, 1977, Ser. No. 770,260

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610527; Jun. 2, 1976, 2624759; Jul. 29, 1976, 2634053

Int. Cl.[2] **A01N** *9/22;* **C07D** *233/66*

U.S. Cl. 71—92 **25 Claims**

1. A 4,5-dichloro-imidazole-2-carboxylic acid amide of the formula

wherein R′ and R″ independently of one another denote hydrogen, C_{1-12}-alkyl optionally substituted by CN, OH, $CONH_2$, COOH, phenyl or N-4,5-dichloroimidazole-2-carboxamide; cyclohexyl, alkenyl or alkynyl with 3-6 carbon atoms; or phenyl or naphthyl, optionally substituted by C_{1-4}-alkoxy, C_{1-4}-halogenoalkyl, halogen, C_{1-4}-halogenoalkyl, halogen, C_{1-4}-alkoxy, C_{1-4}-halogenoalkoxy, acetyl, or phenoxy, naphthoxy, phenylmercapto or naphthylmercapto optionally substituted by halogen, C_{1-4}-alkyl, CF_3, C_{1-4}-alkoxy, NO_2 or C_{1-4}-alkylmercapto, or an acid addition salt thereof.

4,179,278

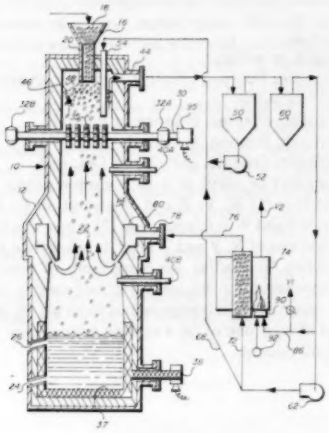
METHOD FOR REDUCING PARTICULATE IRON OXIDE TO MOLTEN IRON WITH SOLID REDUCTANT

Donald Beggs, and David C. Meissner, both of Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 769,242, Feb. 16, 1977, Pat. No. 4,082,543. This application Apr. 3, 1978, Ser. No. 892,564

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—11 **7 Claims**



1. A method of reducing particulate iron oxide material to molten iron with a solid reductant comprising:

(a) continously feeding particulate iron oxide and solid particulate carbonaceous fuel to a particle inlet at the top of a shaft furnace to establish a packed burden therein;

(b) passing an electric current through the burden to provide sufficient heat by electric resistance heating to react said carbonaceous fuel with oxygen from said particulate iron oxide to reduce said iron oxide substantially to metallic iron and to melt the iron and form a molten iron pool;

(c) causing the reaction products to move through said particulate burden in counterflow relation with it, and form a top gas;

(d) removing top gas from the upper region of the shaft furnace;

(e) cooling said top gas;

(f) preheating the cooled top gas;

(g) recirculating the heated gas to the burden through a gas inlet at the lower region of said furnace above said molten metal pool; and

(h) removing molten iron product and slag from an outlet at the bottom of said furnace.

4,179,279

PROCESS FOR TREATING MOLTEN STEEL SLAG WITH RED MUD FROM ALUMINUM INDUSTRY

Genzaburo Harada; Takuma Yen, and Masao Tomari, all of Kitakyushu, Japan, assignors to Nippon Jiryoku Senko Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 727,502, Sep. 28, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,329

Claims priority, application Japan, Oct. 9, 1975, 50-122136; Nov. 7, 1975, 50-134518

Int. Cl.[2] C12B *3/04*

U.S. Cl. 75—24 **3 Claims**

1. A process for treating slag from known converter and electric furnaces to improve the structural stability of such slag and render such slag suitable such as a landfill and construction material as well as a substitute for base material or crushed stone for road construction, comprising the steps of:

(1) providing molten slag produced from a conventional converter or electric furnace in which the furnace is used in conventional steel production and wherein the molten slag when cooled contains Free CaO and $2CaO.SiO_2$ which render such cooled slag unsuitable for landfill purposes due to swelling and structural instability of the Free CaO and $2CaO.SiO_2$ therein,

(2) adding red mud obtained as a by-product from the aluminum industry to the molten slag thereby creating a thermochemical reaction between the red mud and the molten slag to transform a composition of said cooled slag containing the Free CaO and $2CaO.SiO_2$ to a relatively non-swelling and non-crumbling composition, said red mud accounting for 5 to 20 percent of said molten slag after the addition of said red mud, said red mud comprising as a major component Fe_2O_3 and as a lesser component Na_2O, said red mud melting at a temperature lower than the melting temperature of said slag, and

(3) utilizing the heat value of the molten slag to melt said red mud into said molten slag and cause said thermo-chemical reaction, whereby the thus processed cooled slag has structural ability rendering it suitable as a landfill.

4,179,280

DIRECT-REDUCTION PROCESS CARRIED OUT IN A ROTARY KILN

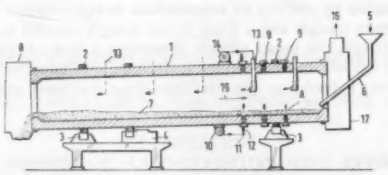
Gerhard Reuter, Frankfurt am Main; Wolfram Schnabel, Hattersheim, and Harry Serbent, Hanau, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,256

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719422

Int. Cl.[2] C21B *13/08*

U.S. Cl. 75—33 **7 Claims**



1. In a process for preparing sponge iron by directly reducing an iron oxide-containing material with the use of solid carbonaceous reducing agents having a content of volatile combustile constituents in a rotary kiln said kiln having a heating-up zone in which the solid charge of iron oxide and reducing agent is heated to approximately the reduction temperature through which kiln the kiln atmosphere and the solid charge material of iron oxide-containing material and reducing agent are countercurrently passed, and wherein oxygen-containing gas is injected at a controlled rate through shell pipes into the free kiln space, the improvement which comprises injecting oxygen-containing gas at controlled rates through nozzle blocks into charge material disposed over said nozzle blocks at that horizontal region of the heating-up zone of which is defined by a point along the length of said heating-up zone where ignitable particles of the solid reducing agent first appear and a second point along the length of said heating-up zone before the point at which the reducing zone begins and injecting oxygen-containing gas at controlled rates through shell pipes into the free kiln space of the heating-up zone.

4,179,281
METHOD FOR COOLING HIGH-TEMPERATURE REDUCED IRON

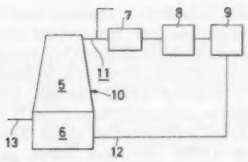
Katsuya Ono, Kitakyushu; Takashi Nakamura, and Toru Wakabayashi, both of Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,850

Claims priority, application Japan, Sep. 7, 1977, 52-107612; Mar. 23, 1978, 53-33322

Int. Cl.[2] C23F *7/04, 9/02*

U.S. Cl. 75—35 **5 Claims**



1. A method for cooling high-temperature reduced iron in a cooling zone, integrated with a direct reducing furnace, under a high pressure condition, which comprises contacting said high-temperature reduced iron, having a temperature of 700° C. or higher, with a hydrogen-containing cooling gas in said cooling zone, the pressure in said cooling zone being 1.5 to 5 kg/cm^2 G, said hydrogen-containing cooling gas containing 5–20% by volume of CO_2 and also containing CO in an amount satisfying the condition that $CO(\%) \leqq 26.7X^{-0.234}$, wherein X is the pressure in said cooling zone.

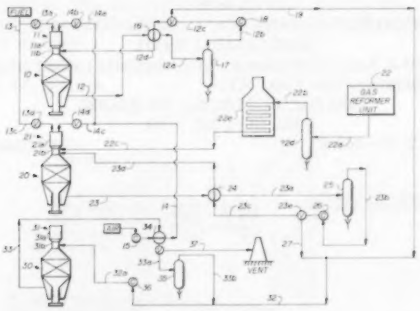
4,179,282
METHOD FOR THE REDUCTION OF METAL OXIDES

Charles A. Rubio, Houston, Tex., assignor to CVG-Siderurgica del Orinoco, C.A., Venezuela

Filed May 11, 1978, Ser. No. 904,976

Int. Cl.[2] C21B *13/00*

U.S. Cl. 75—35 **15 Claims**



1. A process for the production of sponge metal by direct gaseous reduction of metal oxides, comprising:

initially preheating a mass of particulated metal oxide, including

mixing and combusting a stream of fuel with no more than a stoichiometric quantity of an oxygen-containing gas stream to produce a hot combustion gas stream which is depleted of substantially free oxygen; and

passing the hot combustion gas stream through the metal oxide mass;

reducing the preheated metal oxide mass to sponge metal by passing a stream of hot reducing gas through the mass, said hot reducing gas being comprised primarily of hydrogen and carbon monoxide heated to an elevated temperature required for metal oxide reduction by

mixing and combusting a stream of fuel with no more than a stoichiometric quantity of an oxygen-containing gas stream to produce a hot combusion gas stream which is depleted of free oxygen; and

intimately mixing the hot combustion gas stream with a stream of reducing gas comprised primarily of hydrogen and carbon dioxide to elevate the reducing gas stream temperature to said required metal oxide reducing temperature without depleting any hydrogen and carbon monoxide reducing components thereof; and

cooling a resulting mass of reduced sponge metal by passing a stream of cool gas through the resulting mass.

4,179,283
PRODUCTION OF METALS

John E. Rehder, 36 Castle Frank Rd., Apt. 309, Toronto, Ontario, Canada

Filed Mar. 20, 1978, Ser. No. 888,027

Claims priority, application United Kingdom, Mar. 21, 1977, 11872/77; Jul. 13, 1977, 29376/77; Jul. 13, 1977, 29377/77

Int. Cl.[2] C22B *1/08, 1/24*

U.S. Cl. 75—40 **10 Claims**

1. A process for smelting metal oxide to molten metal with improved combustion efficiency, comprising:

forming compacts having a nominal diameter of at least about two inches and consisting essentially of an intimate mixture of metal oxide, solid carbonaceous material, slag material and a binder, the carbon content of said compacts being sufficient for complete reduction of the metal oxide and for combustion, the solid carbonaceous material used for combustion having a volatile matter content of less than about 15% by weight;

charging said compacts to a shaft furnace;

burning said solid carbonaceous material used for combustion in said compacts by air introduced through primary tuyeres near the base of the shaft primarily to carbon dioxide;

controlling the mass flow rate and velocity of air through each tuyere to provide a maximum thrust of air at each primary tuyere to a value of less than 15 pounds, whereby no raceway or cavity is formed at any tuyere, and a space velocity of the combustion air in the furnace referred to the empty shaft at normal temperature and pressure (STP) of greater than 200 feet per minute,

reducing said metal oxide to the corresponding metal under the influence of the heat generated by said combustion using the portion of said solid carbonaceous material in said compacts not used for said combustion; and

withdrawing the resulting molten metal and slag from the shaft furnace.

4,179,284
METHOD FOR DIRECT RECOVERY OF METAL FROM METAL-BEARING ORES

Horst Weigel, and Karl Muller, both of Cologne, Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,391

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655813

Int. Cl.[2] C22B *5/12;* **C21B** *13/02*

U.S. Cl. 75—92 **8 Claims**

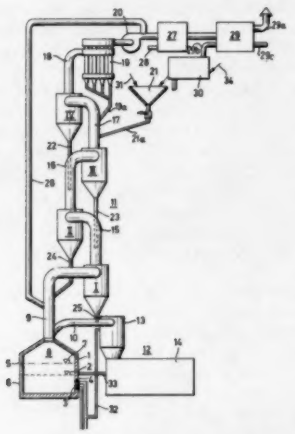
1. In a method for direct recovery of a metal from relatively fine-grained metal-bearing ore particles having an average particle granulation range of less than about 250 microns wherein carbon-containing materials are utilized for reducing such ore to a product of value via a multi-stage counter-current reduction-smelting system having separate and interconnected reaction regions including a reduction gas generator region, a multi-stage sequential ore reduction region and a smelting

reactor region, each region having gas and solid passageways interconnected with corresponding gas and solid passageways of a proceeding region so that a reduction gas flows in one direction from said reduction gas generator region through said system and solid particles flow in an opposite direction from a source thereof through such system, the improvement comprising the following combination of sequential steps:

(a) feeding carbon-containing material and oxygen-containing material to said reduction gas generator region which includes a molten metal bath, said materials being fed into said bath at a location thereof below an upper surface of said bath so as to convert at least a portion of said materials into a relatively hot CO/H_2-rich reduction gas having a temperature above that at which ore particles tend to agglormorate;

(b) diverting a relatively small portion of said hot reduction gas from said reduction gas generator region and conveying such small portion of hot reduction along with a controlled amount of oxygen-containing material to said smelting reactor region for use in smelting of substantially reduced ore;

(c) admixing the remaining portion of said hot reduction gas with expended reduction gas drawn-off from a relatively cool area of said multi-stage sequential ore reduction region to attain a beneficial CO/H_2-rich reduction gas



having a temperature about below that at which ore particles tend to agglormorate and at about the temperature required from dry reduction of ore particles;

(d) conveying said beneficial CO/H_2-rich reduction gas in said one direction through said multi-stage sequential ore reduction region at gas speeds ranging from about 3 to 30 meters per second while substantially simultaneously conveying said relatively fine-grained metal-bearing ore particles in said opposite direction from a source thereof through said multi-stage sequential ore reduction region whereby said ore particles are in counter-current intimate contact with said beneficial CO/H_2-rich reduction gas within said multi-stage sequential ore reduction region so that relatively high and alternating speeds occurs between said gas and said particles as such gas and particles travel from one stage to another stage of said multi-stage sequential or reduction region whereby said ore particles are reduced to such an extend after a last stage of said reduction region as to form substantially reduced ore particles;

(e) admixing the so-attained reduced ore particles along with the mixture of hot reduction gas and oxygen-containing material obtained at step (b) and feeding the resultant admixture directly into said smelting reactor region so as to convert said reduced ore particles to liquid metal; and

(f) withdrawing a portion of so-attained liquid metal from said smelting reactor region as a product of value and conveying another portion of such liquid metal into the molten metal bath within said reduction gas generator region.

4,179,285

FERRITIC STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Inc., Middletown, Ohio

Filed Jul. 27, 1978, Ser. No. 928,595

Int. Cl.[2] C22C *38/24, 38/26*

U.S. Cl. 75—126 E **2 Claims**

1. A substantially fully ferritic stainless steel consisting essentially of, in weight percent, from about 0.05% to about 0.15% carbon, about 0.1% to about 0.7% manganese, about 0.2% to about 0.75% silicon, about 23% to about 28% chromium, about 0.1% to about 0.25% nitrogen, about 0.25% to about 0.6% columbium, about 0.02% to about 0.2% vanadium, about 0.2% maximum molybdenum, about 0.04% maximum phosphorus, about 0.03% maximum sulfur, and remainder essentially iron, with the columbium plus vanadium contents being not more than about 4 times the carbon plus nitrogen contents.

4,179,286

SILVER FREE, LOW GOLD-NOBLE METAL ALLOYS FOR FIRING OF DENTAL PORCELAIN

Helmut Knosp, Pforzheim, Fed. Rep. of Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,191

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813813

Int. Cl.[2] C22C *5/02, 5/00*

U.S. Cl. 75—134 N **10 Claims**

1. A silver-free, low gold, noble metal alloy suitable for firing on dental porcelain consisting essentially of 30 to 55% gold, 30 to 60% palladium, 1 to 12% tin, 0 to 10% indium, 0.1 to 3% germanium and at least one member of the group consisting of 0.05 to 1% rhenium and 0.05 to 1% ruthenium.

4,179,287

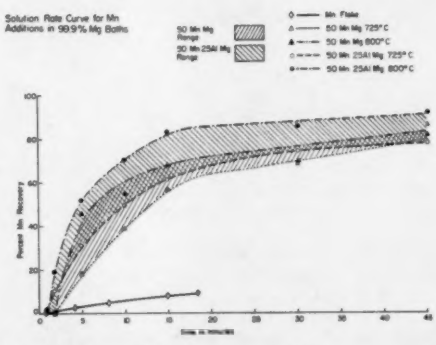
METHOD FOR ADDING MANGANESE TO A MOLTEN MAGNESIUM BATH

Timothy J. Kosto, Youngstown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 19, 1978, Ser. No. 970,983

Int. Cl.[2] C22C *1/02*

U.S. Cl. 75—168 E **12 Claims**



1. A method for making manganese additions to a molten magnesium bath which comprises introducing into the molten magnesium bath a blended mixture consisting essentially of finely divided manganese and a finely divided metal selected

from the group consisting of magnesium and magnesium base alloys containing at least 90 percent magnesium wherein the ratio of manganese to magnesium by weight in the mixture is from about $\frac{1}{4}$ to 8 and the ratio of magnesium to manganese by weight in the mixture is from about 4 to $\frac{1}{4}$ so that the manganese addition is substantially dissolved in the molten magnesium bath at a rate substantially greater than that which would be obtained by the addition of elemental manganese and with substantially complete retention of the finely divided manganese and magnesium addition.

4,179,288

PALLADIUM BASE DENTAL ALLOY

Emil M. Prosen, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posen, Ill.

Filed Jan. 24, 1979, Ser. No. 6,078
Int. Cl.[2] C22C *5/02*
U.S. Cl. 75—172 G **4 Claims**

2. A dental alloy especially adapted for the adhesion of porcelain having a fusing temperature of 1750° F. to 1850° F., consisting essentially of:
Gallium—7% to 12%
Gold—2% to 5%
Boron—0.125% to 0.50%
Palladium—Balance

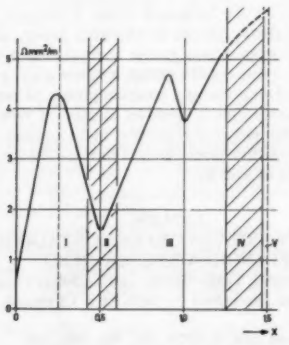
said alloy having a melting temperature of 2375° F. to 2550° F.

4,179,289

ELECTRODE FOR ELECTROCHEMICAL PROCESSES AND METHOD OF PRODUCING THE SAME

Franz Brandmair, Rain; Ottmar Rubisch, Meitingen bei Augsburg, and Dietmar Honig, Augsburg, all of Fed. Rep. of Germany, assignors to Sigri Elektrographit GmbH, Meitingen, Fed. Rep. of Germany

Division of Ser. No. 765,899, Feb. 7, 1977, Pat. No. 4,078,988, which is a division of Ser. No. 541,348, Jan. 15, 1978, Pat. No. 4,029,566. This application Dec. 14, 1977, Ser. No. 860,299
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1974, 2405010
Int. Cl.[2] B22F *3/00, 5/00*
U.S. Cl. 75—206 **1 Claim**



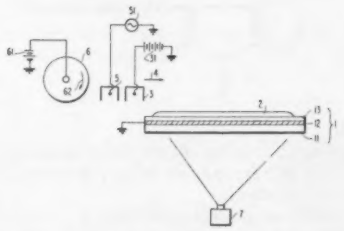
1. Method of producing an electrode for electrochemical processes which comprises mixing titanium powder and titanium dioxide powder in a ratio of 7:1 to 1:3, adding a binding agent thereto, compressing the resulting mixture and sintering it at temperature of 1200° to 1400° C. in an argon atmosphere, and coating the thus compressed and sintered body with a covering layer containing an activating substance.

4,179,290

PHOTOELECTROPHORETIC PHOTOGRAPHY PROCESS INVOLVING DUAL CORONA TREATMENTS OF OPPOSITE POLARITY

Isoji Takahashi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 8, 1978, Ser. No. 884,507
Claims priority, application Japan, Mar. 14, 1977, 52-28321
Int. Cl.[2] G03G *13/22*
U.S. Cl. 430—34 **21 Claims**



1. A photoelectrophoretic image-forming process using a pair of electrodes at least one of which is transparent and at least one of which has an electrically insulating surface, comprising the steps of:
(1) forming a liquid film of a suspension of light-sensitive particles on the electrically insulating surface of one of the electrodes as the first electrode,
(2) in a first showering, showering the liquid film with corona ions of either polarity,
(3) further showering the charged liquid film with corona ions containing corona ions of an polarity opposite to that of the corona ions of the first showering,
(4) positioning the other of the two electrodes facing the first electrode with the liquid film therebetween,
(5) image-wise exposing the liquid film to light through the transparent electrode while simultaneously applying an electric potential across both electrodes such that the polarity of the second electrode is the same as the polarity of corona ions in the first showering, and thereby causing optically-exposed light-sensitive particles in the liquid film to migrate from the first electrode onto the surface of the second electrode, resulting in the production of an image of the light-sensitive particles on at least one of the electrodes.

2. The process of claim 1, wherein the voltage applied to produce said corona ions in said first showering ranges from about 4 kV to about 8 kV, wherein said voltage applied to produce said corona ions in said further showering is an A.C. voltage of about 3 to about 12 kV with a frequency ranging from about 10 Hz to about 100 kHz and the electric potential applied across both electrodes simultaneously with said image-wise exposing of said liquid film ranges from about 300 volts to about 6,000 volts.

4,179,291

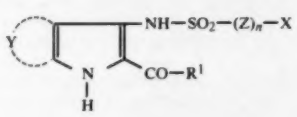
PHOTOGRAPHIC DYE DIFFUSION TRANSFER PROCESS

Hans Vetter, Cologne, and Paul Marx, Leverkusen, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Fed. Rep. of Germany

Filed Oct. 4, 1977, Ser. No. 839,374
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645656
Int. Cl.[2] G03C *1/40, 5/54, 7/00, 1/10*
U.S. Cl. 430—223 **3 Claims**

1. The photographic dye diffusion transfer process for the production of colored images, in which a photographic material comprising at least one light-sensitive silver halide emulsion layer and, associated therewith, a non-diffusible dye-prov-

iding compound which in its oxidized form is capable of releasing a diffusible dye in an alkaline medium, is exposed imagewise and developed with a silver halide alkaline developer which in its oxidized form oxidizes the non-diffusible dye-providing compound and the latter is split by the developer alkali as a consequence of this oxidation, releasing a diffusible dye in image distribution, in which the improvement comprises the non-diffusible dye-providing compound is represented by the following formula:



in which

X represents the residue of a dye precursor which is attached to to the SO_2 group either directly or by way of an intermediate member Z;

Z represents an alkylene group with 1 to 6 carbon atoms, arylene or a heterocyclic group which is attached to the residue X either directly or by way of an —O—, —S—, $—SO_2—$, —NR— (R=hydrogen or alkyl), —CO—, —CO—NH— or $—SO_2—NH—$group;

n is 0 or 1;

Y represents the residue to complete a condensed benzene ring;

R^1 represents $—OR^2—$, or

R^2 represents hydrogen, an alkyl group having from 1 to 22 carbon atoms, or a cycloalkyl or aryl group; the said alkyl, cycloalkyl and aryl groups may in turn be substituted;

R^3 represents one of the residues given under the definition for R^2 or an acyl group derived from aliphatic or aromatic carboxylic or sulphonic acids;

R^4 represents hydrogen or a substituted or unsubstituted alkyl group having from 1 to 22 carbon atoms; and in which R^1 and/or a substituent on the condensed benzene ring which is completed by Y represents or contains a residue which confers diffusion resistance.

4,179,292

LIGHT-SENSITIVE COPYING COMPOSITION

Kurt-Walter Klupfel, and Heide Sprengel, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 851,875

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652304

Int. Cl.[2] G03F *7/02;* **G03C** *5/00, 1/94, 1/52*

U.S. Cl. 430—175 **14 Claims**

1. In a negative-working light-sensitive copying composition comprising at least one condensation product of a diazonium, salt, at least one water-soluble synthetic polymer, and at least one acrylic resin having an acid number between 60 and 200 and which is soluble in an aqueous-alkaline solution, the weight ratio of water-soluble synthetic polymer and acrylic resin being within the limits of 10:90 and 90:10,

the improvement that the water-soluble synthetic polymer is a copolymer of a C_3 to C_{16} alkyl acrylate and an N-vinyl N-alkyl carboxylic acid amide, the alkyl and carboxylic acid groups of which contain 1 to 6 carbon atoms each.

4,179,293

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shigeo Hirano; Keiichi Adachi; Seiki Sakanoue, and Takayoshi Kamio, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 9, 1978, Ser. No. 932,384

Claims priority, application Japan, Aug. 9, 1977, 52-95256

Int. Cl.[2] G03C *1/76, 7/00*

U.S. Cl. 430—551 **17 Claims**

1. A color photographic light-sensitive material comprising a support having thereon at least one layer of a silver halide photographic emulsion with the light-sensitive material containing at least one liquid hydroquinone compound substituted with one or two tertiary alkyl groups having 15 carbon atoms, or a precursor thereof, wherein said tertiary alkyl groups individually have 15 carbon atoms.

4,179,294

SILVER HALIDE LIGHT-SENSITIVE ELEMENT CONTAINING DYE

Masatoshi Sugiyama, and Eiichi Kato, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 781,802, Mar. 28, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,602

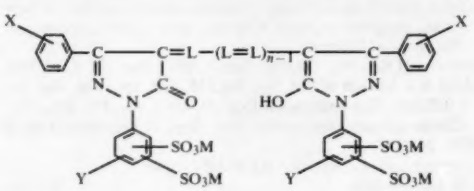
Claims priority, application Japan, Mar. 26, 1976, 51-33165

Int. Cl.[2] G03C *1/84*

U.S. Cl. 430—522 A **16 Claims**

1. A silver halide photographic light-sensitive element comprising a silver halide emulsion layer on a support and at least one hydrophilic colloid layer thereon, the element containing the combination of (1) at least one basic polymer and (2) at least one oxonol dye at a coverage of about 8 to about 800 mg/m^2 represented by the following formula (I):

(I)



wherein X represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an alkylthio group, an alkoxycarbonyl group or an amino group; Y represents a hydrogen atom, a halogen atom, a sulfo group, a lower alkyl group or a hydroxy group; L represents a methine group; M represents a cation; and n represents a positive integer of from 1 to 3, wherein said basic polymer is present in an amount such that about 4 to 20 basic functional groups in the basic polymer are present per mole of said dye.

4,179,295

ORGANOPOLYSILOXANE CONTAINING PLANOGRAPHIC MASTERS

Minoru Takamizawa; Yoshio Inoue, and Toshikazu Sugita, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,318

Claims priority, application Japan, Jun. 7, 1976, 51/66256

Int. Cl.[2] G03G *1/71;* **G03F** *7/02*

U.S. Cl. 428—447 **9 Claims**

1. In a planographic master composed of a substrate and an overlying layer of an organopolysiloxane composition and a photosensitizer, the improvement which comprises said organopolysiloxane composition being composed of

(a) an organopolysiloxane with aliphatically unsaturated link-

ages in the molecule containing organosiloxane units represented by the general formula

$$R^1(R^2)_nSiO_{(3-n)/2}$$

where

R^1 is vinyl, allyl, or ethynyl,

R^2 is a substituted or unsubstituted monovalent hydrocarbon group with from 1 to 10 carbon atoms, free of aliphatic unsaturation and having no mercapto group and

n is zero, 1 or 2, in a mole fraction of from 0.1 to 100 mole %, the balance being organosiloxane units represented by the general formula

$$(R^3)_mSiO_{(4-m)/2}$$

where

R^3 has the same meaning as R^2 above and

m is zero, 1, 2 or 3, and

(b) a mercapto-containing organopolysiloxane containing organosiloxane units represented by the general formula

$$R^4(R^5)_pSiO_{(3-p)/2}$$

where

R^4 is an organic group with at least one mercapto group bonded to a carbon atom selected from the group consisting of $-C_3H_6SH$, $-CH_2SH$, $-C_6H_4SH$, $-C_2H_4CH(CH_2SH)_2$, $-C_2H_4C(C_2H_4SH)_3$, $-C_2H_4SCH_2CH(CH_2SH)_2$, and $-C_2H_4SCH_2C(CH_2SH)_3$,

R^5 has the same meaning as R^2 and

p is zero, 1 or 2, in a mole fraction of from 0.1 to 100 mole %, the balance being organosiloxane units represented by the general formula

$$(R^6)_qSiO_{(4-q)/2}$$

where

R^6 has the same meaning as R^2 and

q is zero, 1, 2 or 3, in an amount that is sufficient to provide from 0.02 to 50 moles of the mercapto groups bonded to the carbon atoms per mole of the aliphatically unsaturated linkages in component (a), and

wherein the amount of component (b) is such that from 0.1 to 10 moles of the mercapto groups in component (b) are provided per mole of the aliphatically unsaturated linkages in component (a), and the amount of the photosensitizer is from 0.05 to 5% by weight based on the total amount of components (a) and (b).

4,179,296

SILVER HALIDE PHOTOGRAPHIC EMULSION

Akira Sato; Atsuo Iwamoto; Takeo Sakai, and Haruo Takei, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 751,833, Dec. 17, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,919

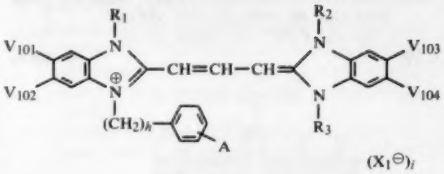
Claims priority, application Japan, Dec. 29, 1975, 50/159261

Int. Cl.[2] **G03C** *1/14, 1/18, 1/19*

U.S. Cl. 430—574 **7 Claims**

1. A silver halide photographic emulsion containing, in supersensitizing amounts, a combination of

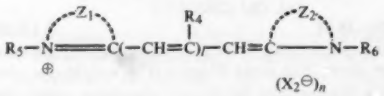
at least one benzimidazolocarbocyanine dye wherein an aralkyl group substituted with an acidic group is connected to at least one nitrogen atom in the imidazole ring, which is represented by the following general formula (I-B)



(I-B)

wherein V_{101}, V_{102}, V_{103} and V_{104}, which may be the same or different, each represents a hyrogen atom, a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a cyano group, a trifluoromethyl group or a hydroxy group, with the proviso that at least one of V_{101} and V_{102}, and V_{103} and V_{104}, represents simultaneously a chlorine atom; R_1, R_2 and R_3, which may be the same or different, each represents an aliphatic group, with the proviso that R_3 can also be a substituted alkyl group; A represents a sulfo group or a carboxy group; X_1 represents an acid residue; h represents an integer from 1 to 6; and i represents 0 or 1;

at least one cyanine dye represented by the following general formula (II):



(II)

wherein Z_1 and Z_2 are selected from one of the following combinations (A)–(E):

(A) Z_1 represents the atoms necessary to complete a naphthothiazole nucleus, and Z_2 represents the atoms necessary to complete a benzothiazole or a naphthothiazole nucleus;

(B) Z_1 represents the atoms necessary to complete a benzothiazole nucleus, and Z_2 represents the atoms necessary to complete a benzoxazole nucleus;

(C) Z_1 represents the atoms necessary to complete a benzothiazole nucleus, and Z_2 represents the atoms necessary to complete a naphthoxazole nucleus;

(D) Z_1 represents the atoms necessary to complete a naphthothiazole nucleus, and Z_2 represents the atoms necessaty to complete a benzoxazole nucleus;

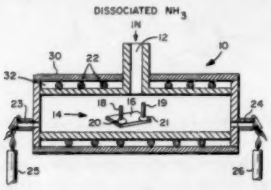
(E) Z_1 represents the atoms necessary to complete a naphthothiazole nucleus, and Z_2 represents the atoms necessary to complete a naphthoxazole nucleus, wherein a heterocyclic nucleus and/or a benzene nucleus, present in a naphthothiazole or naphthoxaxole group, may be substituted with one or more substituents selected from the group consisting of an alkyl group containing 6 or less carbon atoms, an alkenyl group containing 6 or less carbon atoms, a cycloalkyl group containing 6 or less carbon atoms, an aryl group, which may be mono- or bicyclic, a hydroxy group, an alkoxy group containing 7 or less carbon atoms, an acyl group containing 8 or less carbon atoms, a carboxy group, an alkoxycarbonyl group containing 8 or less carbon atoms, or a halogen atom; R_4 represents a hydrogen atom, an aliphatic group or an aryl group; R_5 and R_6, which may be the same or different, each represents an aliphatic group; X_2 represents an acid residue; and l represents 1 and n represents 0 or 1.

4,179,297

BRAZING SLURRY

William E. Buescher, Seneca Falls, N.Y.; Frederick J. Roberto, Emporium, and Isabelle M. Sobierajski, St. Marys, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 26, 1978, Ser. No. 955,087
Int. Cl.[2] C23C *1/12;* B23K *35/34*
U.S. Cl. 106—1.12 **4 Claims**



1. A brazing composition comprising, by weight, a substantially homogeneous suspension of about 15–16.5% fine particle metallic tungsten; about 5–6% calcium oxide; about 4–5% silicon dioxide; about 6–7% aluminum oxide; and about 67–70% of an organic binder.

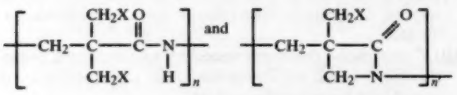
4,179,298

FLAME RETARDANT INTUMESCENT POLYAMIDES

Linnea E. Nelson, and Charles E. Reineke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 18, 1978, Ser. No. 870,312
Int. Cl.[2] C08J *9/02*
U.S. Cl. 106—18.21 **5 Claims**

1. An intumescent flame retardant coating formulation comprising from about 40 to about 99 percent by weight of a combination of a film-forming binder and dispersing agent, and from about 1 to about 60 percent by weight of a polyamide composition comprising repeating structural units of the formulas



wherein

X is independently chloro or bromo, and n and n′ are each independently a positive integer.

4,179,299

SINTERED ALPHA SILICON CARBIDE CERAMIC BODY HAVING EQUIAXED MICROSTRUCTURE

John A. Coppola, Lewiston; Laurence N. Hailey, Niagara Falls, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 901,406, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 584,226, Jun. 5, 1975. This application Mar. 26, 1979, Ser. No. 24,148
Int. Cl.[2] C04B *35/56*
U.S. Cl. 106—44 **16 Claims**

1. A sintered ceramic body consisting essentially of:

(a) from about 91 to about 99.85% by weight silicon carbide, wherein at least 95% by weight of the silicon carbide is of the alpha phase;

(b) up to about 5.0% by weight carbonized organic material;

(c) from about 0.15 to about 3.0% by weight boron; and

(d) up to about 1.0% by weight additional carbon; and having a predominantly equiaxed microstructure.

4,179,300

OPTICAL GLASS

Hiroji Sagara, Akikawa, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Jan. 20, 1978, Ser. No. 871,169
Claims priority, application Japan, Jan. 27, 1977, 52-8096
Int. Cl.[2] C03C *3/10*
U.S. Cl. 106—47 Q **1 Claim**

1. An optical glass not containing PbO and consisting essentially of, in percent by weight, about 33.0% SiO_2, about 4.0% B_2O_3, about 2.0% Li_2O, about 27.4% BaO, about 5.9% CaO, about 4.3% ZnO, about 5.0% ZrO_2, and about 18.4% TiO_2 having a refractive index of about 1.7630, and Abbe number of about 33.0 and an acid resistance of less than 0.1%.

4,179,301

Si_3N_4 CONTAINING INTERGRANULAR PHASE NUCLEATING AGENT AND METHOD

Sergej-Tomislav Buljan, Acton, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 8, 1979, Ser. No. 1,641
Int. Cl.[2] C04B *35/58, 35/04, 35/50*
U.S. Cl. 106—73.5 **14 Claims**

1. A polycrystalline ceramic body consisting essentially of a first phase of Si_3N_4 grains, and a second crystalline intergranular phase comprising SiO_2 and at least one densifying additive, characterized in that the body additionally contains from 100 to 1,000 parts per million of at least one nucleating agent selected from the group consisting of Ti, Fe, and the oxides and nitrides of Ti and Fe to facilitate substantially complete crystallization of the intergranular phase.

4,179,302

RAW MIXTURE FOR THE PRODUCTION OF CEMENT CLINKER

Boris I. Nudelman; Anatoly Y. Gadaev; Marsel Y. Bikbau, and Petr T. Shishkin, all of Tashkent, U.S.S.R., assignors to Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt", U.S.S.R.

Filed Jun. 7, 1977, Ser. No. 804,268
Claims priority, application U.S.S.R., Aug. 20, 1976, 2400246[I]
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—100 **6 Claims**

1. A raw mixture for the production of a cement clinker consisting of the following components, percent by mass:

lime component—55 to 63
clay component—23 to 17
ferrous component—4 to 1
calcium chloride—17.8 to 4
potassium chloride—0.1 to 7.5
sodium chloride—0.1 to 7.5.

4,179,303

METHOD OF PRODUCING STRUCTURAL INSULATION MATERIALS CONTAINING AT LEAST 50 PERCENT XONOTLITE

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 31, 1978, Ser. No. 929,638
Int. Cl.[2] C04B *15/06*
U.S. Cl. 106—119 **6 Claims**

1. The method of producing xonotlite containing structural insulation materials comprising: preparing an aqueous slurry of calcareous and siliceous materials (that are free) having less than approximately 0.01% of reaction poisoning aluminum producing ion in a calcia to silica ratio above approximately 0.90, dispersing more than 2 percent by weight of solids of a filamentizable glass strand throughout the slurry in a monofilament network having a fiber length of more than approximately one eighth inch, causing more than 1 percent by weight of solids of negatively charged wood pulp fibers free of alumi-

num ions to be dispersed throughout the slurry, causing all materials to be sufficiently negatively charged and the water to solids ratio to be less than approximately 4.0 to 1 to produce a thixotropic mixture, shaping the slurry and autoclaving the slurry under heat and pressure to produce the insulation.

4,179,304

FINGER NAIL LACQUER

Robert Rossomando, Branchburg, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Filed Apr. 3, 1978, Ser. No. 893,094
Int. Cl.[2] C08L *1/18;* A61K *7/043*
U.S. Cl. 106—177 **10 Claims**

1. A composition comprising,
a. sucrose benzoate; and
b. sucrose acetate isobutyrate; and
c. an optional plasticizer selected from the group consisting of organic phthalates, adipates and phosphates; and
d. nitrocellulose.

4,179,305

PIGMENT PREPARATION AND USE IN COATING COMPOSITIONS

Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth & Associates, Inc., Schaumburg, Ill.

Continuation of Ser. No. 660,173, Feb. 23, 1976, Pat. No. 4,154,620, which is a continuation-in-part of Ser. No. 505,212, Sep. 12, 1974, abandoned. This application Nov. 20, 1978, Ser. No. 961,872
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.[2] C09C *1/08, 1/20, 1/34*
U.S. Cl. 106—292 **8 Claims**

1. A pigment consisting essentially of a finely divided intimate mixture of calcium silicofluoride and at least one chromium compound selected from the group consisting of chromic acid, strontium chromate, zinc chromate and lead chromate, the quantity of said chromium compound being within the range of 0.05% to 50% by weight of the total solids.

4,179,306

STABILIZING TITANIUM DIOXIDE PIGMENTS WITH VANADATES

Peter Woditsch; Eckhard Bayer; Peter Panek, and Heribert Stutgens, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,711
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729496
Int. Cl.[2] G04B *31/02*
U.S. Cl. 106—300 **4 Claims**

1. A process for the production of a light-stable and weather-stable titanium dioxide pigment comprising precipitating onto the pigment in aqueous suspension a colorless vanadate of at least one of zinc, magnesium, calcium, strontium and barium at a pH-value above 7 in about 0.01 to 5% by weight, expressed as V_2O_5, based on TiO_2.

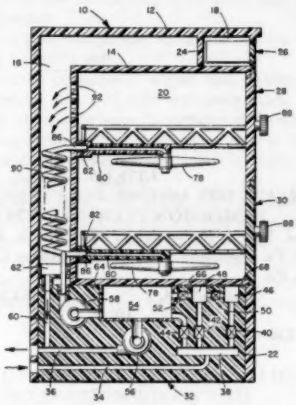
4,179,307

DISH-WASHER CONSISTING OF AN ASSEMBLY OF FUNCTIONAL UNITS MADE OF THERMOPLASTIC MATERIAL

Pasqualino Cau, Oggiono, and Vincenzo Cocca, Cormano, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 15, 1978, Ser. No. 906,195
Claims priority, application Italy, May 13, 1977, 23537 A/77
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—58 D **8 Claims**

1. A dish-washing machine comprising
an outer enclosure comprised of thermoplastic material and having an opening at one side thereof;
an inner enclosure comprised of thermoplastic material and having an opening at one side thereof, said inner enclosure being supported within said outer enclosure and being spaced therefrom;
a plurality of functional units each comprised of a thermoplastic material including
at least one dish-carrying drawer unit slidably mounted within said inner enclosure, a rotor mounted on said drawer unit for distributing water to the dishes in said dish-carrying drawer unit, and a duct coupled to said rotor;
an electrical control unit located in the space between the upper end of said inner enclosure and said outer enclosure, said control unit being provided with openings for the mounting of electrical components; and



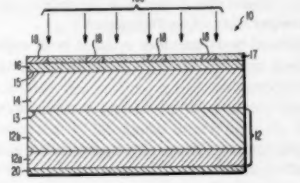
an hydraulic unit located in the space between the lower end of said inner enclosure and said outer enclosure, said hydraulic unit being provided with openings for hydraulic components, salt and ion-exchanging resin containers and water adding and distributing conduits; and
a vapor condenser located in the space between said inner and outer enclosures connecting said hydraulic components to the duct coupled to the rotor of said dish-carrying drawer unit.

4,179,308

LOW COST HIGH EFFICIENCY GALLIUM ARSENIDE HOMOJUNCTION SOLAR CELL INCORPORATING A LAYER OF INDIUM GALLIUM PHOSPHIDE

Gregory H. Olsen, Dayton, and Michael Ettenberg, Freehold, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,643
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 GA **7 Claims**



1. A photovoltaic device comprising:
a body of gallium arsenide exhibiting one type of conductivity;
a layer of gallium arsenide of conductivity opposite to that

of said body overlying and forming a PN junction with said body;

a layer of $In_xGa_{1-x}P$ of the same conductivity type as said layer of gallium arsenide overlying and forming a hetero-transition with said layer of gallium arsenide, wherein x is from about 0.35 to about 0.62 and the thickness of said layer of $In_xGa_{1-x}P$ is less than about 50 nanometers thick whereby said layer is transmissive to photons with a shorter wavelength than the bandgap wavelength of the $In_xGa_{1-x}P$; and

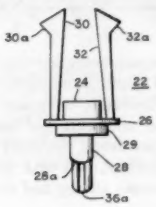
means for electrically contacting said body and said layer of $In_xGa_{1-x}P$.

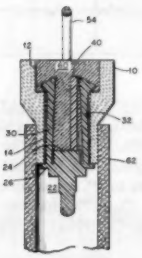
4,179,309

MEANS FOR ASSEMBLING EXPENDABLE IMMERSION THERMOCOUPLES

Richard J. Hance, Philadelphia, and John R. Wiese, Dresher, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Oct. 18, 1978, Ser. No. 952,378
Int. Cl.[2] H01V *1/02*
U.S. Cl. 136—234 **5 Claims**





1. In an expendable immersion thermocouple for determining the temperature of molten metal

a cylindrical body member open at both ends;

a tailpiece member having a plug portion for supporting said thermocouple,

a contact portion for providing a resilient contact backup, and

a flange portion for seating against one end of said body member; and

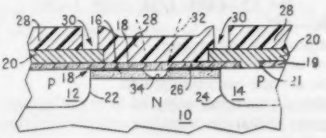
latching means for securing said body member and said tailpiece member together including at least one latch element resiliently supported by said tailpiece member and a cooperating latch element in the inner surface of said body member.

4,179,310

LASER TRIM PROTECTION PROCESS

James B. Compton, Los Gatos; Robert A. Cometta, San Jose, and Daniel D. Culmer, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 3, 1978, Ser. No. 921,743
Int. Cl.[2] H01L *21/268;* **B23K** *27/00*
U.S. Cl. 148—1.5 **15 Claims**



1. In a process for laser trimming of an integrated circuit, the improvement comprising:

(a) forming an oxide at least over a selected portion of the circuit to be trimmed by the laser,

(b) forming a bare layer of a metal reflective to the laser surrounding the selected portion of the circuit and over at least one P-N junction, and

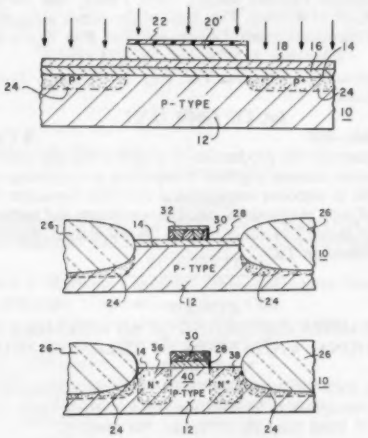
(c) trimming the selected portion of the integrated circuit with the laser.

4,179,311

METHOD OF STABILIZING SEMICONDUCTOR DEVICE BY CONVERTING DOPED POLY-SI TO POLYOXIDES

Terry G. Athanas, Lewisville, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 759,803, Jan. 17, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,361
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **7 Claims**



4. A method of making an isoplanar MOS device comprising the steps:

(a) growing a thick isoplanar field oxide around an active area in a semiconductor substrate,

(b) forming an MOS device in the active area.

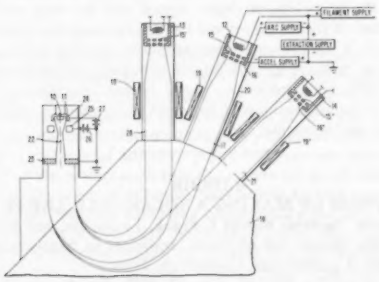
(c) growing a thin thermal oxide in the active area,
(d) depositing a polysilicon layer over both the thick field oxide and the thin thermal oxide,
(e) oxidizing the entire polysilicon layer to produce a polyoxide layer, and
(f) forming contacts through windows in the polyoxide layer.

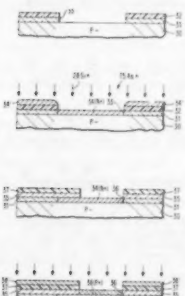
4,179,312

FORMATION OF EPITAXIAL LAYERS DOPED WITH CONDUCTIVITY-DETERMINING IMPURITIES BY ION DEPOSITION

John H. Keller, Newburgh; Charles M. McKenna, Fishkill, and James R. Winnard, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 858,486, Dec. 8, 1977, Pat. No. 4,151,420. This application Nov. 20, 1978, Ser. No. 962,442
Int. Cl.[2] H01L *21/203, 21/263*
U.S. Cl. 148—1.5 **15 Claims**





1. A method for depositing a monocrystalline epitaxial layer of a semiconductor material containing selected conductivity-determining impurities on a semiconductor substrate comprising

directing a beam of ions of said semiconductor material at the surface of the semiconductor substrate at an energy level below 0.5 Kev., and simultaneously directing a beam of said conductivity-determining impurity ions at at least a portion of said substrate surface whereby a layer of semiconductor material containing said conductivity-determining impurities is formed on said surface, and

heating said layer to a temperature of from 550° to 900° C.

4,179,313

METHOD OF MAKING AN ARTICLE HAVING A CAST-IN PLACE BEARING

James H. Koch, Oregon, and Richard A. Ritzenthaler, Toledo, both of Ohio, assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,418, Aug. 18, 1976, abandoned. This application Dec. 23, 1977, Ser. No. 863,717
Int. Cl.[2] B23P *11/00*; C22F *1/00*
U.S. Cl. 148—3 **19 Claims**

1. A method for making a composite part having at least two components wherein one component is movable with respect to another, comprising:

a. introducing a first component having a bearing surface thereon into a casting die;
b. casting a second component within said casting die to form a composite part with said first component;
c. cooling said composite part to ambient temperature to form a casting in which said first component is captured by and is essentially incapable of relative movement with said second component; and
d. then thermally treating said casting by establishing and then substantially eliminating a sufficient temperature differential between said first and second components to free said first component and its bearing surface from said second component, establish a clearance therebetween, and permit relative movement between said components.

4,179,314

TREATMENT OF BERYLLIUM-COPPER ALLOY AND ARTICLES MADE THEREFROM

Keith G. Wikle, Riverview Park, Pa., assignor to Kawecki Berylco Industries, Inc., Boyertown, Pa.

Filed Dec. 11, 1978, Ser. No. 968,218
Int. Cl.[2] C22C *9/04*
U.S. Cl. 148—12.7 C **21 Claims**

1. A process for treating beryllium-copper alloy to optimize elevated temperature properties thereof, said process comprising in sequence:

(a) annealing the alloy at a temperature of between about 1500° F. and about 1800° F.;
(b) quenching the annealed alloy;
(c) cold working the quenched alloy a minimum of about 30%;
(d) subjecting the cold worked alloy to an initial age hardening for between about 0.25 and about 48 hours at a temperature of between about 500° F. and about 800° F.; and
(e) subjecting the age-hardened alloy to a secondary age hardening for between about 0.25 and about 48 hours at a temperature of between about 900° F. and about 1200° F.

4,179,315

SILICON STEEL AND PROCESSING THEREFORE

Clarence L. Miller, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 696,965, Jun. 17, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,956
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **6 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, a permeability of at least 1900 (G/O_e) at 10 oersteds and a core loss of no more than 0.700 watts per pound at 17 kilogauss, which includes the steps of: preparing a melt of silicon steel consisting essentially of, by weight, from 0.02 to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, up to 1.0% copper, no more than 0.008% aluminum, from 2.5 to 4.0% silicon, balance iron; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel; applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement

comprising the steps of coating the surface of said steel with a refractory oxide base coating consisting essentially of:

(a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;

(b) up to 100 parts, by weight, of other substances from the group consisting of boron and compounds thereof, said coating containing at least 0.5%, by weight, of boron;

(c) from 0.5 to 40 parts, by weight, of SiO_2 added as colloidal silica;

(d) up to 20 parts, by weight, of inhibiting substances; and

(e) up to 10 parts, by weight of fluxing agents;

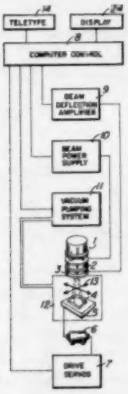
and final texture annealing said steel with said coating thereon; said steel's magnetic properties being in part, attributable to the inclusion of boron and SiO_2 in the base coating.

4,179,316

METHOD AND APPARATUS FOR HEAT TREATING

John F. Connors, Buffalo Grove; Douglas D. Bass, Western Springs; Michael G. Bell, Oak Lawn, all of Ill., and Stanley L. Ream, Columbus, Ohio, assignors to Sciaky Bros., Inc., Chicago, Ill.

Filed Oct. 17, 1977, Ser. No. 843,141
Int. Cl.[2] C21D *1/06, 1/12*
U.S. Cl. 148—152 **19 Claims**



1. A method of surface hardening selected areas of a metal workpiece by means of a concentrated beam of electrons comprising the steps of: generating a beam of electrons;

directing and focusing the said beam of electrons to a desired spot on the surface of the said workpiece;

causing the beam to be displaced to and to dwell in sequence for a pre-settable period ranging from 2 to 200 microseconds at each of a pre-determined matrix of spots over the said selected area in a pre-determined order;

repeating without interruption the said beam displacement and dwell sequence and matrix a pre-set number of times and controlling the beam current so that the material of said selected area and that adjacent to it reaches a temperature above the transformation temperature and close to the melting point for said material and is maintained at the said temperature for a pre-determined interval;

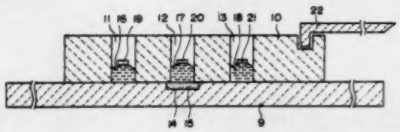
terminating the flow of electron beam current and allowing the material to be quenched rapidly.

4,179,317

METHOD FOR PRODUCING COMPOUND SEMICONDUCTOR CRYSTALS

Kazuo Sakai, Tokyo; Shigeyuki Akiba, Tanashi, and Takaya Yamamoto, Niza, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed May 25, 1978, Ser. No. 909,498
Claims priority, application Japan, May 31, 1977, 52/62853
Int. Cl.[2] H01L *21/208*
U.S. Cl. 148—171 **5 Claims**



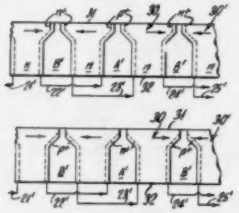
1. In a method for liquid phase epitaxially growing a III–V compound semiconductor crystal comprising at least four constituent elements, the improvement comprising: providing a melt of the III–V compound semiconductor on a two-element single crystal substrate; providing another two-element single crystal having the same composition as said substrate and in contact with said melt; and selecting a contact area between the two-element single crystal and the melt and the Miller index of the single crystal for determining the composition of III–V compound semiconductor crystals grown by liquid phase epitaxial growth on said substrate and for minimizing any difference between crystal lattice constants of the III–V compound semiconductor crystals grown on said substrate and said substrate.

4,179,318

METHOD OF MAKING A SOLAR-CELL ARRAY

Roy Kaplow, Newton; Robert I. Frank, Lexington, and Joel L. Goodrich, Quincy, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 877,356, Feb. 13, 1978, Pat. No. 4,129,458.
This application Jul. 20, 1978, Ser. No. 926,235
Int. Cl.[2] H01L *31/06, 27/14*
U.S. Cl. 148—187 **6 Claims**



1. The method of making a solar-cell array comprising a plurality of spaced, elongate, units having body material of a first conductivity type, each unit having upstanding sidewalls and having therebetween an upper surface adapted for exposure to receive incident radiation, adjacent pairs of sidewalls at first spaces between adjacent units each including a region of a second conductivity type, adjacent pairs of sidewalls at second spaces between adjacent units being devoid of second conductivity-type regions, and first-space pairs of sidewalls being in alternating interlace with second-space pairs of sidewalls in a given direction of traverse of the units of said array; which method comprises selecting a wafer of semiconductor substrate material of said first conductivity type, cutting a first series of elongate parallel grooves in said wafer at twice the center-to-center spacing of said units, forming said second

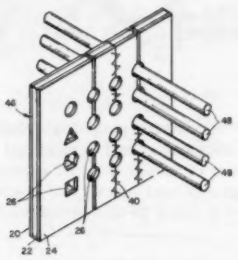
conductivity-type regions in the sidewalls of the grooves of said first series, and thereafter cutting a second series of elongate grooves parallel to those of said first series, the grooves of said second series being in alternating interlace with those of said first series.

4,179,319

HEAT RECOVERABLE ARTICLE AND METHODS USING SAME

Clyde A. Lofdahl, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 24, 1977, Ser. No. 762,432
Int. Cl.[2] B32D *3/10;* **B29C** *27/00*
U.S. Cl. 156—86 **15 Claims**



1. A heat recoverable article comprising at least two wafers of heat recoverable material, each of the wafers being a thin layer of a polymeric material which is heat-shrinkable in at least two directions in its plane such that each wafer recovers from its outer circumferential periphery towards its center, and at least one layer of adhesive positioned between and bonded to two of the wafers such that the wafers are at all times separated by the layer of adhesive, said article further comprising at least one aperture extending continuously through the wafers and the adhesive layer therebetween such that none of the adhesive is disposed within the apertures of the wafers before the recovery of the article, the apertures being adapted to receive a substrate extending through the article, whereby heating the article to the recovery temperature of the wafers causes each of the wafers to recover from its outer circumferential periphery towards its center such that the wafers draw the adhesive layer down against the substrate to form a bond with the portion of the substrate which lies between the wafers, and the wafers provide strain relief for the substrate.

15. A method for environmentally sealing the rear of an electrical connector of the type having a plurality of individually insulated electrical conductors extending from a tubular rear portion comprising the steps of:

positioning the individually insulated electrical conductors through corresponding apertures extending continuously through the thickness of a heat recoverable sealing disc which comprises a first and a second wafer of a heat recoverable material, each of the wafers being a thin layer of a polymeric material which is heat-shrinkable in at least two directions in its plane such that each wafer recovers from its outer circumferential periphery towards its center, and a layer of adhesive positioned between and bonded to both of the wafers such that the wafers are at all times separated by the adhesive layer;

positioning a heat shrinkable sleeve over the tubular rear position of the electrical connector and the periphery of the heat recoverable sealing disc; and

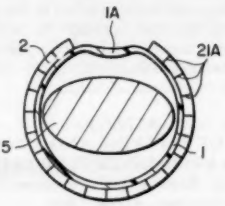
heating the heat recoverable sealing disc and the heat-shrinkable sleeve to their recovery temperatures causing each of the wafers to recover from its outer circumferential periphery towards its center such that each of the wafers recovers around the conductors thereby drawing the adhesive layer down against the conductors to form a bond with the portion of each conductor which lies between the wafers, and causing a portion of the adhesive layer to be extended from the outer circumferential periphery of the heat recoverable sealing disc such that the extruded adhesive forms a bond with an interior surface portion of the heat shrinkable sleeve, and said heat shrinkable sleeve to recover around said tubular rear portion of the electrical connector thereby environmentally sealing the rear of the electrical conductor.

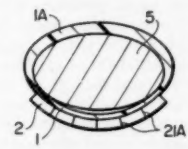
4,179,320

RECOVERABLE ARTICLES

John A. Midgley, San Carlos, and David D. Nyberg, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 10, 1978, Ser. No. 895,064
Int. Cl.[2] B32B *31/00;* **F16L** *11/00;* **B29C** *13/00, 27/00*
U.S. Cl. 156—86 **50 Claims**





1. A flexible, shrinkable, hollow article which comprises

(1) a hollow inner member which is composed of an elastomeric material and which is in a radially extended condition; and

(2) a hollow outer restraining means

(a) whose inner surface is secured to the outer surface of said inner member and which maintains said inner member in said radially extended condition, said inner and outer surfaces being secured to each other by a bond whose peel strength is less than 50 lb. per linear inch width at 21° C.;

(b) whose outer surface forms the outer surface of said article and is provided with at least one score line whose depth is 5 to 90% of the thickness of the restraining means; and

(c) is composed of a material which

(i) has a 2% secant modulus at 21° C. of 4,000 to 120,000 psi;

(ii) has an ultimate elongation at 21° C. of at least 20% at a separation speed of 200% per minute and at most 150% at a separation speed of 2,000% per minute; and

(iii) has a notch sensitivity such that by distorting the article so as to exert a bending moment about the axis of the score line, the depth of said score line can be sub-

stantially increased to provide at least one section of the restraining means which can be pulled away from the inner member.

28. A flexible, shrinkable, hollow article which comprises

(1) a flexible hollow inner member which is composed of an elastomeric material and which is in a radially extended condition; and

(2) a flexible hollow outer restraining means

(a) whose inner surface is bonded to the outer surface of the inner member and which maintains the inner member in the radially extended condition, the inner and outer surface being bonded to each other by a bond whose peel strength is 7 to 15 lbs. per linear inch width at 21° C.;

(b) whose outer surface is provided with at least one linear indentation whose depth is 50 to 90% of the thickness of the restraining means; and

(c) is composed of a material which

(i) has a notch sensitivity such that by distorting the article so as to exert a bending moment about the axis of such a linear indentation, the depth of such linear indentation can be substantially increased to provide at least one section of the restraining means which can be pulled away from the inner member; and

(ii) has a 2% secant modulus at 21° C. of 15,000 to 40,000 psi and has an ultimate elongation at 21° C. of 50 to 100% at a separation speed of 20% per minute, wherein the material has sufficient flexibility that (a) the cross-section of the restraining means can be deformed without breaking the bond between the inner member and the restraining means and (b) such a pulled away section can bend through at least a 90° angle without cracking.

4,179,321

METHOD OF APPLYING AND ADHEREING LUBRICANT TO A TIRE INNER TUBE AS IT IS FORMED

George T. Verghese, Bombay, India, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 17, 1978, Ser. No. 906,721
Int. Cl.[2] B29H *15/00*
U.S. Cl. 156—118 **5 Claims**

5. In the method of manufacturing a tube for pneumatic tires comprising a rubber compound containing natural or synthetic rubber, the steps comprising mixing a binder having a melting point below a first temperature and a powdery lubricating agent in a predetermined ratio to form a lubricant, extruding an unvulcanized rubber compound through an extruder to form a continuous annular shape, the surfaces of said shape when it exits said tuber being at a second temperature which is above said first temperature, applying said lubricant to both the inner and external surface of said annular shape, melting said binder to form a film containing said lubricating agent on said surfaces of said shape, cooling said shape to solidify said binder and encapsulate said lubricating agent within said binder film, and processing the resulting lubricated shape by further, standard means to form said tube.

4,179,322

METHOD FOR MAKING BONDABLE FINGER CONTACTS

Vernon L. Brown, Boulder; Wade H. Greenwood, Northglenn, and Gary L. Griffith, Arvada, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

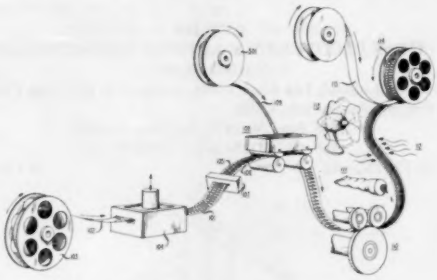
Filed Mar. 28, 1978, Ser. No. 891,038
Int. Cl.[2] H01R *9/00;* **B65H** *81/00*
U.S. Cl. 156—192 **11 Claims**

1. A method for making bondable finger contacts for application to a printed circuit board including the steps of:

forming a strip of virtually continuous, flat, electrically conductive material so as to produce a plurality of spaced-apart finger contacts integral with and interconnected by at least one support carrier, each of the finger contacts having a contact region thereon;

selectively applying a coating of contact metal to said contact region of said finger contacts wherein said coating of contact metal applied to the contact region is a layer of soft gold followed by a stripe of hard gold;

applying a tape having an adhesive on one side thereof to



one side of the contact region of said plurality of contacts to protect, interconnect and support said contacts; and

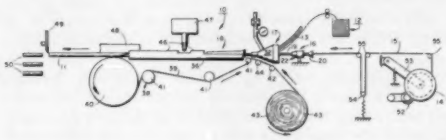
applying a coat of adhesive to an opposite side of said contact region of said plurality of contacts to facilitate bonding said contacts to said circuit board.

4,179,323

METHOD FOR MAKING A HOLLOW FILTER ROD

Ned A. Sigmon, Durham, N.C., assignor to Liggett Group Inc., Montvale, N.J.

Division of Ser. No. 596,471, Jul. 16, 1975, Pat. No. 4,024,012, which is a continuation of Ser. No. 391,581, Aug. 27, 1973, abandoned. This application Feb. 17, 1977, Ser. No. 769,616
Int. Cl.[2] A24C *5/50*
U.S. Cl. 156—201 **1 Claim**



1. In a method of making a filter rod for cigarette filter tips, the steps of

generating a first stream composed of self-supporting, non-deformable rigid tubing;

generating a second stream composed of fibrous cellulose acetate filter material;

passing said first stream through a guide mandrel for coaxially centering said first stream in relation to said second stream;

placing said streams in juxtaposition during travel while simultaneously enveloping said second stream of fibrous material circumferentially about said first stream of tubing by passing said second stream through a Venturi shaped nozzle which coaxially surrounds said guide mandrel;

directing a flow of air through said nozzle in a direction toward the exit end of said guide mandrel causing said second stream to be bloomed and pushed along the surface of said mandrel into an inwardly tapering passageway;

generating a third stream of paper;

moving said three streams into said passageway and constricting said second stream about said first stream as said first stream leaves the exit end of said mandrel inside said passageway to frictionally engage said first stream under a force sufficient to cause the continued travel of said first stream with said second stream;

circumferentially enveloping said third stream about said

juxtaposed first and second stream during continued travel of said three streams;

folding opposite edges of said paper stream over each other and adhere said edges together after enveloping said paper stream about said first and second streams to form a filter rod, and

cutting said filter rod into predetermined lengths.

4,179,324

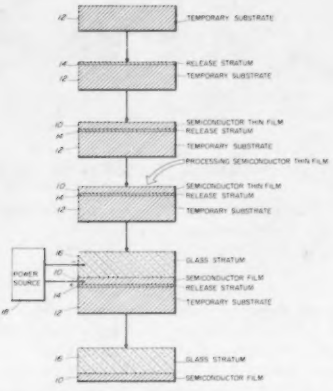
PROCESS FOR FABRICATING THIN FILM AND GLASS SHEET LAMINATE

Allen R. Kirkpatrick, Lowell, Mass., assignor to Spire Corporation, Bedford, Mass.

Filed Nov. 28, 1977, Ser. No. 855,418

Int. Cl.[2] B29C *19/02;* **B32B** *31/00*

U.S. Cl. 156—230 **10 Claims**



1. A method for fabricating a thin film and glass stratum laminate comprising the steps of:

(a) depositing applying thin film material onto a temporary substrate by a deposition process;

(b) superposing a glass stratum on said thin film;

(c) exposing said superposed glass stratum and thin film to a thermal environment which does not exceed the softening point of said glass stratum;

(d) electrostatically bonding said glass stratum and said thin film; and

(e) removing said temporary substrate from said bonded thin film and glass stratum laminate structure.

4,179,325

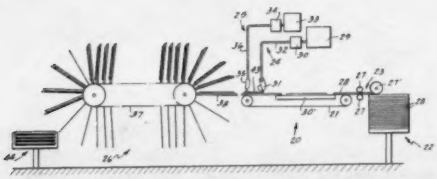
APPARATUS FOR MANUFACTURING ADHESIVE COVERS

Henry N. Staats, Deerfield; Waldemar M. Schmidt, Niles, and Efrain A. Davila, Chicago, all of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Continuation of Ser. No. 558,794, Mar. 17, 1975, abandoned. This application Jun. 5, 1978, Ser. No. 912,831

Int. Cl.[2] B05C *1/02, 1/04;* **B42C** *9/00*

U.S. Cl. 156—498 **21 Claims**



1. Apparatus for manufacturing adhesive covers, each said cover having a backbone portion to which hot melt adhesive is applied, said apparatus comprising:

feed means for feeding cover material into the apparatus;

transport means moving said cover material forwardly in an edgewise direction;

scoring means for making score lines on the cover material to define a backbone on the cover;

pre-warming means for moving excess moisture from the cover backbone;

hot melt adhesive applicator means for applying adhesive to the backbone portion of the cover material; and

cooling means for cooling the molten adhesive below its tack point;

said hot melt adhesive applicator means comprising an extrusion die including a plurality of discharge nozzles rotational about an axis transverse to the direction of movement of the cover material about which axis said extrusion die may be rotated to bring each of said discharge nozzles successively into position for extruding hot melt adhesive onto the moving cover material and whereby each of said discharge nozzles may be flipped away from the cover material and substantially forward in the direction of movement of the forward moving cover material as cessation of adhesive flow occurs to effect breaking of an adhesive thread created during the adhesive applying process.

3. Apparatus for manufacting adhesive covers, said cover having a backbone portion to which hot melt adhesive is applied, said apparatus comprising:

feed means for feeding cover material into the apparatus;

transport means moving said cover material forwardly in an edgewise direction;

scoring means for making score lines on the cover material to define a backbone on the cover;

pre-warming means for removing excess moisture from the cover backbone;

hot melt adhesive applicator means for applying adhesive to the backbone portion of the cover material;

said hot melt adhesive applicator means comprising an extrusion die having at least one discharge nozzle, said extrusion die being rockably mounted about a pivot axis substantially spaced from the transport means and generally transverse to the direction of movement of the cover material whereby said at least one discharge nozzle may be flipped away from the cover material as cessation of adhesive flow occurs with the component of movement of said at least one discharge nozzle in the direction of movement of the forward moving cover material being substantially greater than its component of movement away from the cover material thereby breaking the adhesive thread created during the adhesive applying process and displacing it in said forward direction; and

cooling means for cooling the molten adhesive below its tack point.

4,179,326

PROCESS FOR THE VAPOR GROWTH OF A THIN FILM

Daiziro Kudo, Yokohama; Kazuo Maeda, Chigasaki, and Eiki Tanikawa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Apr. 14, 1977, Ser. No. 787,495

Claims priority, application Japan, Apr. 22, 1976, 51-44922; Apr. 22, 1976, 51-44923; Apr. 30, 1976, 51-48507

Int. Cl.[2] B01J *17/26*

U.S. Cl. 156—612 **23 Claims**

1. A process for the vapor growth of a thin film on the exposed surface of each of a plurality of wafers, said method comprising the steps of:

supporting said plurality of wafers at their peripheral edges within, and essentially concentric with and substantially perpendicular to the axis of, a reaction tube, to provide a constant clearance W between the inner wall of said reaction tube and said wafers around substantially the entire portion of said peripheral edges, and said wafers being

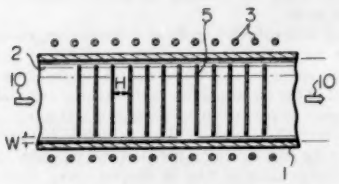
arranged to have a constant distance H between adjacent pairs of said exposed surfaces;

flowing a reaction gas through said reaction tube via said clearance W;

heating said wafers to a required uniform temperature for depositing said film on said wafers; and

maintaining a pressure within said reaction tube at a predetermined reduced average value P;

wherein said supporting step comprises arranging said wafers so that the ratio of said H to said W is determined by



$$H/W=a\cdot P+b \quad (1)$$

in the range $1.2\leqq P\leqq 5.0$ Torr, wherein "a" $\leqq 0.8$ Torr^{-1} and "b" is a constant in the range from 0.3 to 1.2 depending on the kind of said reaction gas, and by

$$0.8P+0.3=H/W=2 \quad (2)$$

in the range $0.5\leqq P\leqq 1.2$ Torr.

4,179,327

PROCESS FOR COATING PYROTECHNIC MATERIALS

Alvin A. Seldner, Saugus, Calif., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 13, 1978, Ser. No. 924,262

Int. Cl.[2] C23F *1/00*

U.S. Cl. 156—667 **8 Claims**

1. A method of treating the surface of a pyrotechnic propellant material prior to application of a coating on said material which comprises etching the surface of the material with a solution comprised of about 1 to 10 vol. % water and 99 to 90 vol. % of a C_1 to C_4 aliphatic alcohol for an effective amount of time.

4,179,328

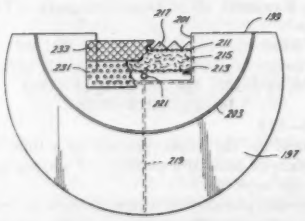
METHOD AND APPARATUS FOR INJECTING STRIPPING GAS INTO THE REBOILER SECTION OF A GLYCOL REBOILER

Frank J. Barra, and Richard L. Schleier, both of Houston, Tex., assignors to Smith Industries, Inc., Houston, Tex.

Filed Jan. 13, 1978, Ser. No. 869,300

Int. Cl.[2] B01D *1/14*

U.S. Cl. 159—16 R **9 Claims**



1. A glycol dehydration reboiler comprising:

a generally cylindrical tank having a front end and a back end with heating means extending longitudinally in the tank from the front end thereof part way toward the back end of the tank and means at the upper part of the tank near the front end thereof for connection to a still column and to glycol inlet means, and outlet means at the lower part of the tank near the back end thereof for removal of glycol from the tank;

divider means located in the tank between the heating means and the back end of the tank and dividing the tank between upstream and downstream sections, said divider means including a partition extending upwardly from the bottom of the tank near the heating means and terminating at a level a distance below the top of the tank, said partition having a slot in its upper edge, a trough extending from the slot longitudinally of the tank at a distance above the bottom of the tank toward the back end of the tank, and a weir across the back end of the trough; and

sparging means for introducing dry gas into the upstream section of the tank comprising an apertured pipe extending along the length of the trough below the level of the weir, said sparging means further including a layer of packing means in the trough above the pipe.

4,179,329

REMOVAL OF COLOR FROM PAPER MILL WASTE WATERS

Jerry J. Svarz, La Grange, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 9, 1976, Ser. No. 647,757

Int. Cl.[2] D21C *11/00*

U.S. Cl. 162—29 **2 Claims**

1. A process for removing color from cellulose paper pulp bleachery effluent waste waters wherein color bodies are present due to chemical reaction on or degradation of lignin which comprises adjusting the pH of said waste waters to a pH within the range of 2 to 7, mixing with the resultant waste waters a polyethylene imine having an average molecular weight of 300 to 1800, the amount of said imine being within the range of 10 to 2000 ppm of said waste waters and being sufficient to combine with said color bodies to form water insoluble solids, subsequently adding to said waste waters an amine having at least one hydrocarbon group containing from 8 to 24 carbon atoms linked to amino nitrogen without organic solvent, and separating the resultant solids.

4,179,330

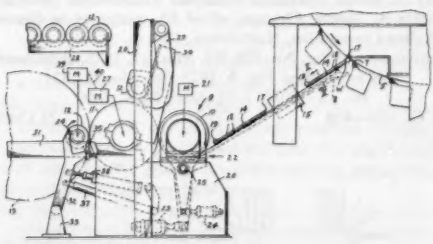
APPARATUS FOR HANDLING WEB MATERIAL, AND METHOD

Robert E. Page, R.R. 1, Lake Summerset, Davis, Ill. 61019

Filed Sep. 5, 1978, Ser. No. 939,462

Int. Cl.[2] D21F *7/02*; D21G *1/02, 9/00*

U.S. Cl. 162—113 **35 Claims**



27. A method of handling a continuously running creped tissue web following creping at a creping roll, comprising:

transferring the creped web at high speed a short draw span from the creping roll to a proximate calender including a rotary roll;

suppressing flutter of the web as it travels said draw span at said high speed;

calendering the web in a nip of said calender roll with a rotary reel drum;

and rotatably driving a reel core by nipping the reel core with said reel drum and thereby winding the web onto the reel core.

4,179,331

GLASS FIBER DISPERSIONS FOR MAKING UNIFORM GLASS FIBER MATS BY THE WET-LAID PROCESS

Paritosh M. Chakrabarti, Wayne, N.J., assignor to GAF Corporation, New York, N.Y.

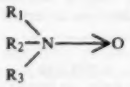
Filed Nov. 15, 1977, Ser. No. 851,683

Int. Cl.[2] D21F *11/00*

U.S. Cl. 162—156 **22 Claims**

1. In the manufacture of uniform glass mats at a high rate of production by the wet-laid process, the improved method which comprises

forming an aqueous dispersion of glass fibers by mixing bundles of said fibers of about ¼ to 3 inches in length in an aqueous medium at a fiber consistency of about 0.001 to 3.0% with about 5–500 ppm of an amine oxide surfactant having the formula:



where R_1, R_2, and R_3 are selected from the group consisting of aliphatic and aromatic hydrocarbon radicals, substituted or unsubstituted, containing between 1 and 30 carbon atoms, being the same or different, the sum of R_1, R_2 and R_3 being between about 14 to 40, thereby to substantially disperse said bundles into individual fibers within the aqueous medium, and,

passing said dispersion through a mat-forming screen to form the desired uniform glass fiber mat.

4,179,332

APPARATUS FOR DAMPING PRESSURE AND CONSISTENCY PERTURBATIONS IN A PULP SUSPENSION FLOW

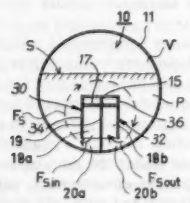
Erkki Ilmoniemi, Vaajakoski, and Olavi Kokkonen, Jyväskylä, both of Finland, assignors to Valmet Oy, Finland

Filed Jun. 26, 1978, Ser. No. 918,948

Claims priority, application Finland, Jul. 1, 1977, 772075

Int. Cl.[2] D21F *1/06*

U.S. Cl. 162—380 **3 Claims**



1. Apparatus for damping pressure and consistency disturbances or perturbations in the flow of a pulp suspension to a headbox of a paper making machine, comprising:

an enclosed damping tank defining therewithin a space for a volume of air and a space for pulp suspension, such that said pulp suspension and air volume will have direct interfacing contact therebetween;

distribution header means disposed within said tank for conducting a flow of pulp suspension into said tank;

collecting header means disposed within said tank for conducting a flow of said pulp suspension out of said tank; and

said distribution and collecting header means each defining pulp suspension flow passages, each of said flow passages being in fluid communication with said pulp suspension space within said damping tank through an elongate, continuous slit, said distribution and collecting header means being open at one side of said damping tank and being defined by an upper wall member, a pair of longitudinally extending side wall members and a longitudinally extending, substantially vertical partition member disposed between said side wall members, each elongate, continuous slit being defined by the lower edge of a respective side wall member and said damping tank.

4,179,333

METHOD FOR MAKING WATER-SOLUBLE ELASTIN HYDROLYZATES

Klaus Braeumer, Weinheim an der Bergstrasse; Zdenek Eckmayer, Heidelberg; Alexander Berg, Holzminden; Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim and Rohm GmbH, Darmstadt, both of, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,237

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705670

Int. Cl.[2] C12D *13/06*

U.S. Cl. 435—60 **7 Claims**

1. A method for making a water-soluble elastin hydrolyzate from starting materials containing elastin which comprises first subjecting said starting material to acid treatment at a pH below about 4 and at a temperature above about 80° C. and then enzymatically degrading the acid-treated material, while in comminuted form, in an aqueous bath at a temperature between about 30° C. and 70° C. for from 4 to 24 hours, in the presence of urea, with an alkaline bacterial proteinase having an activity optimum in a range between pH 9 and pH 13, the initial pH of the enzymatic treatment being within the pH range optimum for the enzyme employed.

4,179,334

HYDROLYSIS OF PROTEIN-BOUND TRIGLYCERIDES

Theodore W. Esders, Webster; Charles T. Goodhue, Rochester, and Christine A. Michrina, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,798

Int. Cl.[2] G01N *31/14*

U.S. Cl. 195—30 **25 Claims**

1. A process for hydrolyzing protein-bound triglycerides consisting of contacting in an aqueous medium protein-bound triglycerides and a reagent consisting of a compatible mixture of (i) a lipase preparation having triglyceride hydrolase activity and derived from a source selected from the group consisting of *Candida rugosa* and *Chromobacterium viscosum* (variant *paralipolyticum*); and (ii) a synthetic surfactant selected from the group consisting of salts of alkylaryl polyether sulfonates and alkoxy polyethoxy ethanols.

4,179,335

THERMOSTABLE LACTASE DERIVED FROM *BACILLUS COAGULANS*

Margaret E. Long, and Chin K. Lee, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 529,329, Dec. 4, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,094

Int. Cl.[2] C12D *13/10*

U.S. Cl. 435—99 **6 Claims**

1. A process for producing a lactase having improved ther-

mal stability which comprises cultivating an organism belonging to the species *Bacillus coagulans* in a nutrient medium under conditions suitable for producing said lactase and recovering the lactase thereby produced, said lactase retaining a substantial amount of activity for at least one hour at 60° C. as determined by assaying lactase activity associated with washed cells of said organism suspended in a 0.05 M phosphate buffer at pH 7.0 in the presence of o-nitrophenyl-β-galactoside.

4,179,336

MICROBIOLOGICAL DEGRADATION OF STEROL SIDE CHAINS TO A 17-KETO GROUP

Alfred Weber; Mario Kennecke, and Helmut Dahl, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengellschaft, Bergkamen and Berlin, Fed. Rep. of Germany

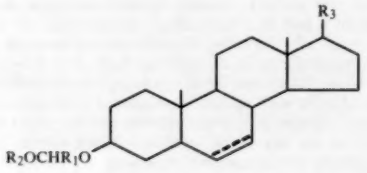
Filed Jul. 6, 1977, Ser. No. 813,391

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632677

Int. Cl.[2] C07B *29/02*

U.S. Cl. 435—55 **10 Claims**

1. In a process for the production of 17-keto steroids of the androstane series by subjecting a steroid having a sterol hydrocarbon side chain at the 17-position to the oxidative degradation activity of a culture of microorganism which degrades sterol side chains to 17-keto group, the improvement which comprises conducting the fermentation in the absence of an inhibitor whch inhibits attack on the ring system and employing as the starting steroid a sterol 3-acetal of the formula



wherein is a single bond or a double bond; R_1 is H or lower alkyl, R_2 is alkyl, whose chain optionally is interrupted by an oxygen atom; and R_3 is a sterol side chain.

4,179,337

NON-IMMUNOGENIC POLYPEPTIDES

Frank F. Davis, 19 Farmingdale Rd., East Brunswick, N.J. 08816; Theodorus Van Es, 313 Overbrook Rd., Piscataway, N.J. 08854, and Nicholas C. Palczuk, 45 W. Franklin St., Bound Brook, N.J. 08805

Continuation-in-part of Ser. No. 596,931, Jul. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 381,191, Jul. 20, 1973, abandoned. This application Jul. 28, 1977, Ser. No. 819,831

Int. Cl.[2] C07G *7/00, 7/02;* **A61K** *37/26, 37/48*

U.S. Cl. 435—181 **27 Claims**

1. A physiologically active, substantially non-immunogenic water soluble polypeptide composition comprising, a physiologically active polypeptide coupled with a coupling agent to at least one substantially linear polymer having a molecular weight of between about 500 to about 20,000 daltons selected from the group consisting of polyethylene glycol and polypropropylene glycol

wherein the polymer is unsubstituted or substituted by alkoxy or alkyl groups, said alkoxy or alkyl group possessing less than 5 carbon atoms.

4,179,338

MICROBIOLOGICAL MEDIUM SUITABLE FOR STERILIZATION BY IONIZING RADIATION

Maurice R. Gordon, 15 Stuyvesant Cir. W., South Setauket, N.Y. 11733

Continuation-in-part of Ser. No. 834,169, Sep. 19, 1977, abandoned. This application Apr. 27, 1978, Ser. No. 900,791

Int. Cl.[2] C12K *1/00, 1/10*

U.S. Cl. 435—243 **7 Claims**

1. An improved microbiological medium suitable for sterilization by ionizing radiation comprising a buffer solution containing nutrients for microorganisms and an electron acceptor, the electron acceptor comprising α or β nicotinamide adenine dinucleotide reduced form, disodium (NADH) in combination with a compound selected from the group consisting of β nicotinamide mononucleotide; β nicotinamide mononucleotide reduced form, disodium; α or β nicotinamide adenine dinucleotide (NAD); pyridoxine hydrochloride; pyridoxal-5-phosphate, HCl; nicotinamide adenine dinucleotide phosphate (NADP); cytochrome-C and nicotinamide-1 N^6 etheno adenine dinucleotide phosphate, the electron acceptor being present at a level sufficient to allow the medium to be sterilized using ionization radiation without causing adverse change in the medium as compared to when no electron acceptor is present and at a sufficient level to increase the degree of ionization caused by ionizing radiation whereby the number of microorganisms destroyed during sterilization is increased as compared to when no electron acceptor is present.

4,179,339

LIQUID FEEDER FOR AUTOMATIC CULTURE APPARATUS

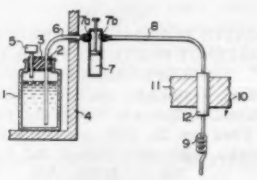
Shinroku Sogi; Makoto Yoshinaga, both of Hachioji; Toshio Shinohara, Chofu; Takayuki Aihara, and Ikuo Tawara, both of Hachioji, all of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Feb. 13, 1978, Ser. No. 876,894

Claims priority, application Japan, Mar. 2, 1977, 52-24766[U]; Apr. 5, 1977, 52-41589[U]; Apr. 5, 1977, 52-41592[U]

Int. Cl.[2] C12K *1/10*

U.S. Cl. 435—292 **8 Claims**



1. A liquid feeder for automatic culture apparatus comprising:

a liquid storage container for storing a a liquid;

a liquid suction and delivery pump for withdrawing said stored liquid from said container and for delivering said liquid through a liquid delivery port of said pump;

a first tube interconnecting said pump with said container;

a second tube extending through a wall of an incubator, which wall serves to isolate the environment in said incubator from the ambient environment, said second tube having a first end connected with said liquid delivery port of said pump and a second end directed towards a given position within said incubator; and

a tube fitting extending through said wall and including an outer pipe hermetically secured to said wall and extending into said incubator, and also including an inner pipe which is hermetically and detachably secured to said outer pipe, said second end of said second tube extending through said inner pipe and surrounded by a silicone filler which seals and secures said second tube to said inner pipe.

4,179,340
APPARATUS FOR SUPPLYING PREHEATED COAL CHARGES TO COKING CHAMBERS

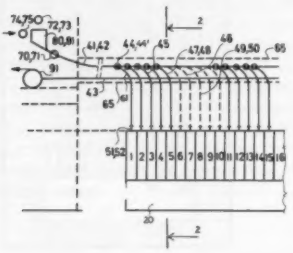
Jaroslav Limberg; Tomas Limberg, both of Prague, and Vaclav Rayman, Milevsko, all of Czechoslovakia, assignors to Hutni project Praha, projekcni a inzenyrska, Prague, Czechoslovakia

Filed Mar. 11, 1977, Ser. No. 776,747

Claims priority, application Czechoslovakia, Mar. 26, 1976, 1990/76

Int. Cl.² C10B *31/00*

U.S. Cl. 202—262 **4 Claims**



1. Arrangement for supplying preheated coal particles to a battery of coking ovens, comprising pneumatic charging containers for preheated coal particles, means for closing the charging containers, means for supplying a pressurized inert carrier gas to said containers, a pneumatic transport conduit for conveying a mixture of the preheated coal particles and the carrier gas connected to said containers and extending substantially above the longitudinal axis of the coking ovens forming the coking battery and adapted for feeding the coking ovens with coal, at least two spaced charging ports at the top of each coking oven, a degassing separator disposed above each coking oven and below said pneumatic transport conduit, conduit means including valve means for connecting the degassing separators to the pneumatic transport conduit, each degassing separator having an inlet for the mixture of coal particles and inert carrier gas, an outlet for the carrier gas, and an outlet for the separated coal particles, means to divide the separated coal charge into at least two streams, and conduit means for receiving the respective streams of coal particles connected to the respective charging ports of the respective coking ovens.

4,179,341
METHOD FOR PREPARATION OF A PLATED PRODUCT

Hajime Sakano, Hirakata; Shigemitsu Kawagishi, Kadoma; Mikio Kodama, Takatsuki; Akitoshi Ito, Yao; Toshihiro Shoji, Amagasaki; Miyuki Terada, Amagasaki, and Isao Yoshida, Amagasaki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

Filed Jun. 12, 1978, Ser. No. 914,824

Claims priority, application Japan, Jun. 10, 1977, 52-69013; Jun. 14, 1977, 52-70179; Aug. 1, 1977, 52-92775

Int. Cl.² C25D *5/56*

U.S. Cl. 204—20 **23 Claims**

1. A method for preparation of a plated product which comprises electroplating a molded product of a resin composition consisting essentially of at least one kind of thermoplastic resin and carbon black having an oil absorption amount of not less than 200 ml/100 g and a surface area of not less than 500 m^2/g in a weight proportion of 100:3–100 and having an intrinsic volume resistivity of not more than 10^3 Ω.cm without previous electroless plating.

4,179,342
COATING SYSTEM METHOD FOR COLORING ALUMINUM

Adam J. Walsh, Barrington, R.I., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 920,053, Jun. 28, 1978, abandoned. This application Jan. 2, 1979, Ser. No. 22

Int. Cl.² C25D *11/22*

U.S. Cl. 204—35 N **17 Claims**

1. In a process for the production of colored protective coatings on previously anodized articles of aluminum or aluminum alloys wherein an alternating current is passed between an electrode system comprising said previously anodized aluminum article and a counterelectrode immersed in an acidic aqueous bath containing salts of metals capable of coloring the anodized layer and wherein voltage with controlled asymmetry is applied to the electrodes so as to control the color tone of the aluminum article by modulating the voltage externally of said electrode system, the improvement which comprises,

anodizing said aluminum article in aqueous acid electrolyte comprising from about 12 to about 24 weight percent sulfuric acid and from about 1 to about 4 volume percent of a polyhydric alcohol of from 3 to 6 carbon atoms and from about 1 to about 4 volume percent of an organic carboxylic acid containing at least one reactive group in the alpha-position wherein said reactive group is a hydroxy, amino, keto or carboxyl group, and carrying out the anodizing at a temperature of from 65°–85° F. at a current density of 24–36 amperes/sq. ft. so as to obtain an anodized layer from 0.2–1.1 mils.

4,179,343
ELECTROPLATING BATH AND PROCESS FOR PRODUCING BRIGHT, HIGH-LEVELING NICKEL IRON ELECTRODEPOSITS

Robert A. Tremmel, Woodhaven, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Feb. 12, 1979, Ser. No. 11,270

Int. Cl.² C25D *3/56*

U.S. Cl. 204—43 T **14 Claims**

1. An aqueous bath suitable for the electrodeposition of bright, high-leveling nickel-iron electrodeposits comprising nickel ions and iron ions, from about 5 to about 100 g/l of a complexing agent selected from the group consisting of tartaric acid, bath soluble salts thereof and mixtures thereof, from about 1 to about 50 g/l of a reducing saccharide, from about 0.5 to about 3 g/l of a compound selected from the group consisting of ascorbic acid, isoascorbic acid, bath soluble salts thereof and mixtures thereof, from about 30 to about 60 g/l of a buffering agent selected from the group consisting of boric acid and sodium acetate, from about 0.5 to about 20 g/l of a bath soluble primary brightener selected from the group consisting of sulfo-oxygen, sulfur bearing compounds, from about 0.25 mg/l to about 1 g/l of a secondary brightener, and hydrogen ions to provide a pH ranging from about 2.6 to about 4.5.

4,179,344
GOLD ALLOY PLATING COMPOSITIONS AND METHOD

Donald W. Thomson, East Northport, N.Y., assignor to Lea-Ronal, Inc., Freeport, N.Y.

Continuation of Ser. No. 375,370, Jul. 2, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,321

Int. Cl.² C25D *3/62*

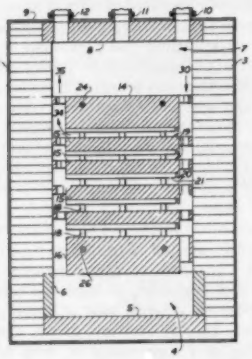
U.S. Cl. 204—44 **8 Claims**

1. An aqueous alkaline bath for direct current plating gold-copper-cadmium alloys comprising an alkaline aqueous bath containing a soluble gold cyanide, a soluble copper cyanide, free cyanide, and a cadmium compound in sufficient amount to plate gold-copper-cadmium alloys, and a chelating agent capable of chelating the cadmium in the presence of free cyanide in a sufficient amount to chelate the cadmium.

4,179,345
CONTROLLED WETTABILITY GRAPHITE ELECTRODES FOR SELECTIVE USE IN ELECTROLYSIS CELLS

Subodh K. Das, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 26, 1979, Ser. No. 15,302
Int. Cl.[2] C25B *11/12*; C25C *3/06, 3/12*
U.S. Cl. 204—67 **21 Claims**



1. A method for the production of aluminum in an electrolytic cell containing a halide of said aluminum dissolved in a molten solvent bath of higher decomposition potential, the cell including a plurality of interelectrode spaces between opposed anode and graphite cathode electrode surfaces wherein:

(a) said bath is moved through a plurality of said interelectrode spaces where said bath is electrolyzed to deposit molten aluminum at the cathode surface thereof, the bath moving through at least one first interelectrode space at a velocity of 1½ feet per second or less;

(b) said first interelectrode space being provided with a graphite cathode surface which is wetted by said aluminum produced from said bath as it is deposited at said cathode surface, said wetted graphite being produced:

(1) from isotropic coke graphitized at a temperature of 1800° to 3000° C.; or

(2) from non-acicular coke graphitized at less than 2500° C.; or

(3) from acicular coke graphitized at a temperature of less than 2300° C.;

(c) such interelectrode spaces through which said bath moves through a velocity of over 1½ feet per second are provided with a graphite cathode surface which is not wetted by said aluminum produced from said bath as it is deposited at said cathode surface, said non-wetted graphite being produced:

(1) from non-acicular coke graphitized at a temperature of at least 500° C.; or

(2) from acicular coke graphitized at a temperature of at least 2300° C.

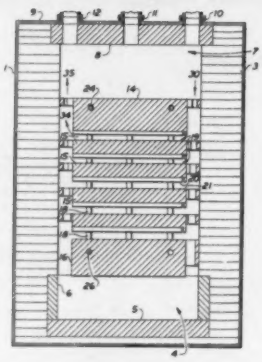
4,179,346
SELECTIVE USE OF WETTABLE AND NON-WETTABLE GRAPHITE ELECTRODES IN ELECTROLYSIS CELLS

Subodh K. Das, Apollo, and Paul J. Boget, Murrysville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 26, 1979, Ser. No. 15,303
Int. Cl.[2] C25C *3/06*
U.S. Cl. 204—67 **21 Claims**

1. A method for the production of aluminum in an electrolytic cell containing a halide of said aluminum dissolved in a molten solvent bath of higher decomposition potential, the cell including a plurality of interelectrode spaces between opposed anode and graphite cathode electrode surfaces wherein:

(a) said bath is moved through a plurality of said interelectrode spaces where said bath is electrolyzed to deposit molten aluminum at the cathode surface thereof, the bath moving through at least one first interelectrode space at a velocity of 1½ feet per second or less;



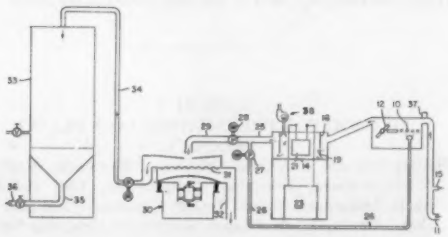
(b) said first interelectrode space being provided with a graphite cathode surface which is wetted by said aluminum produced from said bath as it is deposited at said cathode surface;

(c) such interelectrode spaces through which said bath moves through a velocity of over 1½ feet per second are provided with a graphite cathode surface which is not wetted by said aluminum produced from said bath as it is deposited at said cathode surface.

4,179,347
SYSTEM FOR ELECTROCATALYTIC TREATMENT OF WASTE WATER STREAMS

William A. Krause, Houston, Tex., and Evan P. Shea, Kansas City, Mo., assignors to Omnipure, Inc., Houston, Tex.

Filed Feb. 28, 1978, Ser. No. 882,264
Int. Cl.[2] C02B *1/82*
U.S. Cl. 204—149 **8 Claims**



1. A process for the electrocatalytic treatment of waste water stream containing suspended solids and pathogenic organisms comprising:

adding a measured quantity of an electrolyte which, on being subjected an electrolyzing current, generates chlorine in situ, to an influent waste water stream,

passing the waste water stream through and between a plurality of closely spaced, planar, electrocatalytically active electrode plates having exposed surfaces including a precious metal or precious metal oxide positioned in an electrolytic treatment vessel parallel to the flow of the waste water stream through the treatment vessel,

maintaining the liquid level of the waste water stream in the

electrolytic treatment vessel substantially constant relative to the plurality of electrode plates,

delivering an electrolyzing quantity of electric current to the electrode plates to generate chlorine, oxygen and other disinfecting chemicals in situ and concurrently generate a multitude of gaseous bubbles which entrain and float nutrient-containing suspended solids in the waste water stream as a foam on the surface of the stream in the electrolytic treatment vessel,

withdrawing the foam containing the entrained suspended solids from the surface of the stream in the electrolytic treatment vessel,

discharging the treated waste water stream from the electrolytic treatment vessel into a filter for removal of fibrous residual suspended solids contained in the stream, and

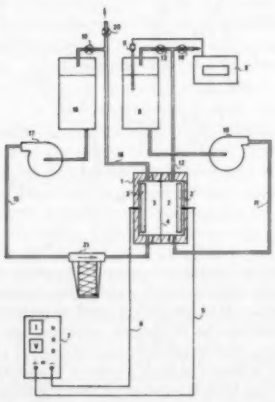
measuring the conductivity of the waste water stream entering the electrolytic treatment vessel and continuously controlling the amount of electrolyte added to the incoming waste water stream to maintain the conductivity of the stream being treated substantially constant, thereby controlling the amount of residual chlorine present in the treated waste water stream discharged from the electrolytic treatment vessel.

4,179,348

REMOVAL OF CYANIDE FROM WASTE WATER

Jean-Pierre Bernat, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Nov. 3, 1977, Ser. No. 848,298
Claims priority, application France, Nov. 3, 1976, 76 33076
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—151 **5 Claims**



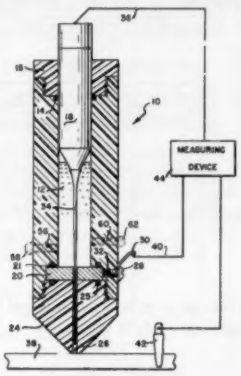
1. A method of eliminating CN^{31} ions from waste water by anodic oxidation, wherein the water for processing enters only the anodic compartment of an electro-dialyser consisting essentially of a semi-permeable diaphragm which is permeable to cations and separates the anode compartment from the cathode compartment, and a separate aqueous solution of electrolyte is conveyed through the cathode compartment, said separate electrolyte comprising an electrolyte from a source other than said water to be processed.

4,179,349

PORTABLE PROBE TO MEASURE SENSITIZATION OF STAINLESS STEEL

Jang Y. Park, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1978, Ser. No. 945,924
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 R **4 Claims**



1. A probe for field measurement of sensitization of a test piece of stainless steel at a test point comprising:

a reservoir containing an electrolyte;

a connecting capillary tube connecting the reservoir to the test piece;

a standard calomel reference electrode having an extended capillary tube disposed in the connecting tube and open near the test point, and further having an external connecting wire;

a graphite electrode disposed in the reservoir in electrical contact with the electrolyte;

an external electrical connection disposed outside the reservoir;

means for connecting the external electrical connection to the graphite electrode; and

means for establishing electrical contact with the test piece near the test point.

4,179,350

CATALYTICALLY INNATE ELECTRODE(S)

Gary A. Deborski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1978, Ser. No. 939,561
Int. Cl.[2] C25B *11/06;* **C25C** *7/02;* **C25D** *17/10;* **H01B** *1/02*
U.S. Cl. 204—284 **14 Claims**

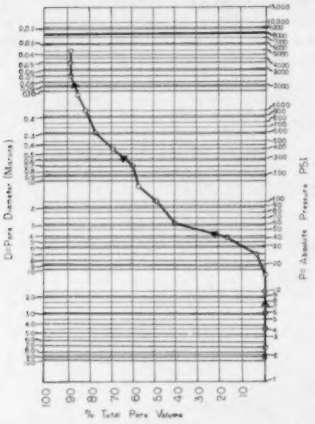
1. An integral, catalytically-active porous electrode body formed of:

a shaped mass of compacted, integrated powder comprised of an intimate, substantially uniform admixture of:

a preponderant proportion of said mass of finely communitated, particulate, metal powder; and

a minor proportion of an electrocatalytic metal phthalocyanine powder;

said mass being cohesively bonded together by consolidation of the individual metal phthalocyanine powder and metal



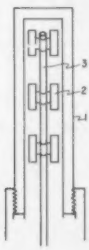
particles therein so as to leave internal pores and interstitial passageway voids in said body.

4,179,351

CYLINDRICAL MAGNETRON SPUTTERING SOURCE

John T. Hawton, Jr., and William G. Shumate, both of Colorado Springs, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 9, 1976, Ser. No. 721,740
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—298 **7 Claims**



1. A magnetron sputtering source comprising:

a cathode having a face of material to be sputtered, having a hollow interior, and having base and end regions;

means for circulating a coolant within said cathode comprising a first coolant tube within said cathode extending from the base region to substantially the end region of said cathode and forming a first fluid conduit for the flow of coolant throughout the interior of said cathode, and comprising means forming a second fluid conduit for the flow of coolant throughout the interior of said cathode terminating near the base region of said cathode;

a magnet within the hollow interior of said cathode for the generation of a magnetic field proximate to the outer surface of said cathode for concentrating charged particles proximate to said cathode, said magnet mounted to said first coolant tube whereby said cathode can be replaced without disturbing said first coolant tube or said magnet; and

means providing an electrical connection to said cathode.

4,179,352

COAL LIQUEFACTION PROCESS

Edward Effron, Springfield, N.J., assignor to Exxon Research & Engineering Co., Florham Par , N.J.

Filed Aug. 7, 1975, Ser. No. 602,956
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—8 LE **10 Claims**

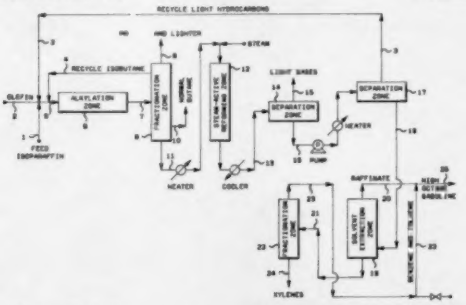
1. A process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises contacting said carbonaceous solids with a hydrogen-donor solvent and a hydrogen-containing gas under liquefaction conditions in a liquefaction zone and recovering a liquefaction effluent from said liquefaction zone; separating said liquefaction effluent into a vaporous stream and a liquids stream; treating at least a portion of said vaporous stream for the removal of ammonia and acid gas constituents and recovering a hydrogen-containing gaseous effluent; recovering a liquid hydrocarbon stream containing hydrogen-donor solvent constituents from said liquids stream; introducing said hydrogen-containing gaseous effluent and said liquid hydrocarbon stream into a catalytic solvent hydrogenation zone maintained under solvent hydrogenation conditions; recovering a hydrogenated effluent from said solvent hydrogenation zone; separating said hydrogenated effluent into a vaporous fraction containing molecular hydrogen and a liquids fraction; recycling at least a portion of said vaporous fraction including molecular hydrogen for introduction into said liquefaction zone; and recovering from said liquids fraction a liquid product stream and a recycle liquid stream for introduction as solvent into said liquefaction zone.

4,179,353

CONVERSION OF LOW OCTANE NUMBER ALKYLATE TO HIGH OCTANE GASOLINE AND AROMATICS

Thomas Hutson, Jr., and Floyd E. Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1977, Ser. No. 813,365
Int. Cl.[2] C10G *39/00*; C07C *3/52*
U.S. Cl. 208—65 **7 Claims**



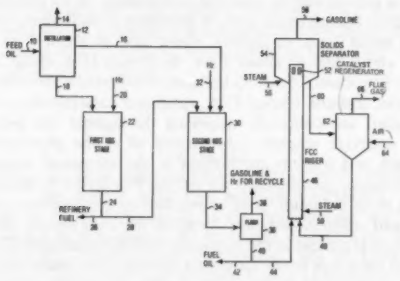
1. An alkylation process comprising alkylating an isoparaffin intentionally with olefins which yield a low octane value alkylate, in the presence of an alkylation catalyst intentionally under conditions including the deliberate selection and use of low-octane producing olefins including a substantial proportion of propylene and butene-1 which produce low-octane alkylate, said olefins having been formed in an ensuing reforming operation, and intentionally at a low isoparaffin to olefin ratio which will produce a low octane value alkylate product, thus to produce an alkylate product constituted by C_5 hydrocarbons and heavier and composed of components of relatively low octane value of the order of about below 90, Research Octane Number clear, and then reforming said alkylate product as obtained upon separation only of n-butane and lighter hydrocarbons therefrom in a reforming zone in the presence of a catalyst under conditions including a temperature in the approximate range of from about 1000° to about 1150° F. to produce reformed alkylate product having Research Octane

Number clear of at least about 95, said reforming zone being the situs of said reforming operation.

4,179,354
COMBINATION RESIDUAL OIL HYDRODESULFURIZATION AND CATALYTIC CRACKING PROCESS

James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,878
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—89 16 Claims

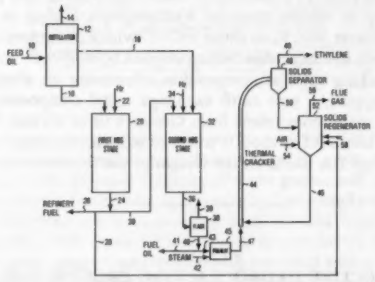


1. A combination process including hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least two hydrodesulfurized residual oil streams having different respective 1050° F.+ hydrocarbon and sulfur contents, said process employing upstream and downstream hydrodesulfurization stages containing hydrodesulfurization catalyst comprising Group VI and Group VIII metal on a noncracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, followed by a catalytic cracking step at a temperature between 900° and 1,100° F. and a residence time up to 5 seconds, said process comprising fractionating said feed oil into an asphaltene-containing residual oil and a distillate oil, passing said residual oil and hydrogen through said upstream hydrodesulfurization stage and recovering an upstream stage effluent stream containing 1050° F.+ hydrocarbons including refractory sulfur asphaltenes, splitting said upstream stage effluent stream into a first effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said upstream stage effluent stream and a second effluent portion, removing said first effluent portion from said process to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfur-reactive material in said downstream stage, passing said second effluent portion and said distillate oil and hydrogen through said downstream stage, recovering a downstream stage effluent stream containing hydrodesulfurized oil including 1050° F.+ hydrocarbons, said downstream stage effluent stream containing aromatics and having a sulfur concentration which is at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first effluent portion allowing the sulfur concentration in said downstream effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes, passing said hydrodesulfurized oil through a zeolitic cracking riser for conversion to gasoline, the removal of said first effluent portion from said process increasing the amount of 1050° F.+ hydrocarbons per barrel of oil vaporized at the flash vaporization temperature in said cracking riser.

4,179,355
COMBINATION RESIDUAL OIL HYDRODESULFURIZATION AND THERMAL CRACKING PROCESS

James A. Frayer, Pittsburgh; Harry C. Stauffer, Cheswick; Francis E. Wynne, Jr., Allison Park, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Oct. 20, 1977, Ser. No. 843,880
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—89 16 Claims



1. A combination process including hydrodesulfurization of an aromatics- and asphaltene-containing feed oil to produce at least two hydrodesulfurized residual oil streams having different respective asphaltene and sulfur contents, said process employing upstream and downstream hydrodesulfurization stages containing hydrodesulfurization catalyst comprising Group VI and Group VIII metal on a non-cracking support at a temperature between 600° and 900° F. and a hydrogen pressure between 500 and 5,000 psi, followed by a thermal cracking step utilizing inert hot solids as a heat source, said process comprising fractionating said feed oil into an asphaltene-containing residual oil and a distillate oil, passing said residual oil and hydrogen through said upstream hydrodesulfurization stage and recovering an upstream stage effluent stream containing refractory sulfur asphaltenes, splitting said upstream stage effluent stream into a first effluent portion comprising between about 10 and 75 weight percent of the normally liquid material in said upstream stage effluent stream and a second effluent portion, removing said first effluent portion from the hydrodesulfurization operation to selectively remove refractory sulfur asphaltenes from said process and to increase the concentration of more sulfurreactive material in said downstream stage, passing said second effluent portion and said distillate oil and hydrogen through said downstream hydrodesulfurization stage, said distillate oil bypassing said upstream hydrodesulfurization stage, recovering a downstream stage effluent stream, said downstream stage effluent stream containing aromatics and having a sulfur concentration which is at least 75 percent lower than the sulfur concentration of said feed oil, the removal of said first effluent portion allowing the sulfur concentration in said downstream stage effluent stream to be achieved with a relatively high aromatics concentration as compared to the aromatics concentration when achieving the same sulfur concentration by hydrodesulfurization without selective removal of refractory sulfur asphaltenes, passing said downstream stage effluent stream and regenerated inert hot solids through a thermal cracking riser at a temperature between 1,300° and 2,500° F. for a residence time between 0.05 and 2 seconds for conversion to a thermally cracked effluent stream including ethylene, separating coke-containing solids from said thermally cracked effluent stream, passing said coke-containing solids to a regeneration zone for combustion of coke therefrom, and recycling hot solids from said regeneration zone to said thermal cracking riser.

4,179,356

HYDROCRACKING WITH CATALYST MODIFIED BY GROUP IIA

Mark J. O'Hara, Mt. Prospect; Russell W. Johnson, Hoffman Estates, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 838,435, Sep. 30, 1977, Pat. No. 4,141,860. This application Nov. 13, 1978, Ser. No. 960,333

Int. Cl.[2] C10G *13/02;* **B01J** *29/12*

U.S. Cl. 208—111 **7 Claims**

1. In a process for hydrocracking hydrocarbons boiling above about 650° F. at a temperature in the range of about 400° F. to about 1000° F. at elevated pressures up to about 3000 psig. selectively to middle distillate hydrocarbons boiling in the range of about 350° F. to about 650° F. which comprises contacting said hydrocarbons boiling above about 650° F. with a hydrocracking catalyst composition comprising an alumina-zeolite support, a rare earth exchange metal component, at least one metal component from Group VIB or Group VIII and from about 0.1 to about 5 wt. % of at least one component from Group IIA based on the weight of the finished catalyst.

4,179,357

SELECTIVE HYDROCRACKING PROCESS FOR MIDDLE DISTILLATE

Mark J. O'Hara, Mt. Prospect, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 27, 1978, Ser. No. 928,655

Int. Cl.[2] C10G *13/02;* **B01J** *35/02, 29/12*

U.S. Cl. 208—111 **3 Claims**

1. In a process for the hydrocracking of hydrocarbon feed stock having an initial boiling point of at least about 650° F. in contact with a catalyst comprising an alumina-zeolite support, a rare earth exchange metal component, and a Group VIB or Group VIII metal component, the method of improving the hydrocracking selectivity of said catalyst with respect to the formation of middle distillate hydrocarbons boiling in the range of about 300° F. to about 650° F., which comprises employing said catalyst in the form of particles having a nominal diameter of less than 0.04 inches.

4,179,358

FLUID CRACKING CATALYST PROCESS USING A ZEOLITE DISPERSED IN A MAGNESIA-ALUMINA-ALUMINUM PHOSPHATE MATRIX

Harold E. Swift, Gibsonia; John J. Stanulonis, Pittsburgh, and Elizabeth H. Reynolds, Verona, all of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Nov. 8, 1978, Ser. No. 958,628

Int. Cl.[2] C10G *11/02;* **B01J** *8/24, 23/94, 27/14*

U.S. Cl. 208—114 **17 Claims**

1. A process for increasing the gasoline yield and quality in a petroleum cracking reaction by contacting a hydrocarbon feedstock under catalytic cracking conditions with a catalyst comprising a magnesia-alumina-aluminum phosphate matrix characterized after calcination at 500° C. for 10 hours as amorphous, and having an average pore radius of from about 10° A to about 200° A; a surface area ranging from about 100 M^2/g to about 350 M^2/g; a pore volume of from about 0.3 cc/g to about 1.5 cc/g; and wherein the magnesia-alumina-aluminum phosphate matrix has a mole percent ratio of from about 10:80:10 to about 25:10:65, and wherein said matrix retains at least 90% of its surface area when the matrix is additionally calcined at a temperature up to about 750° C. for about 10 hours; said matrix being composited with from about 5 to about 50 weight percent of a REY-zeolite.

4,179,359

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 739,887, Nov. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,041, Nov. 14, 1975, Pat. No. 4,009,123, which is a division of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Jul. 12, 1978, Ser. No. 924,112

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **15 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon and hydrogen at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material contaoning, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % Group IVA metal, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, iridium, Group IVA metal and catalytically available cobalt are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and iridium are present in the elemental metallic state; wherein substantially all of the Group IVA metal is present in an oxidation state above that of the corresponding metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,179,360

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John F. Flagg, Rosemont, and George J. Antos, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 27, 1978, Ser. No. 928,650

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **19 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt.% platinum group metal, about 0.05 to about 5 wt.% nickel, about 0.1 to about 10 wt.% uranium, and about 0.1 to about 3.5 wt.% halogen; wherein the platinum group, catalytically available nickel, and uranium components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the uranium component is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,179,361

SORBENT REGENERATION IN A PROCESS FOR REMOVING SULFUR-CONTAINING IMPURITIES FROM MINERAL OILS

Manfred J. Michlmayr, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 13, 1978, Ser. No. 960,501

Int. Cl.[2] C10G *29/16, 25/12*

U.S. Cl. 208—244 **7 Claims**

1. A non-hydrogenative process for upgrading a mineral oil feed containing a minor amount of sulfur-containing impurities, comprising:

(1) producing a sulfur-containing sorbent and a resulting oil by contacting said feed and a particulate sorbent at a temperature in the range of from about 250° C. to 500° C.

and a liquid hourly space velocity in the range of from about 0.1 to 20, said sorbent consisting essentially of a minor amount of cobalt oxide disposed upon porous alumina, and said resulting oil, relative to the feed, having a substantially lower content of said impurities;

(2) separating said resulting oil and sulfur-containing sorbent; and

(3) regenerating said sorbent by steps including:

(a) oxidizing at least a major portion of the sulfur content of said sulfur-containing sorbent by heating said sorbent in the presence of molecular oxygen at a temperature in the range of from about 400° to 800° C. for a period in the range of from about 0.5 to 2 hours;

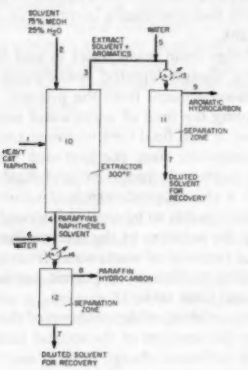
(b) heating said oxidized sorbent resulting from step (a) at a temperature in the range of from about 700° to 1000° C. for a period in the range of from about 0.2 to 5 hours; and

(c) contacting the heated sorbent resulting from step (b) with wet air or steam at a temperature in the range of from about 400° to 600° C. for a period in the range of from about 0.5 to 2 hours.

4,179,362
PROCESS FOR AROMATICS EXTRACTION FROM A 300°–430° F. BOILING RANGE NAPHTHA

Cyrus A. Irani, 312 Penn Lear Ct., Monroeville, Pa. 15146; Stephen S. Kasegrande, 80 Mountain Height Ave., Lincoln Park, N.J. 07035; Daniel J. McHugh, 204 W. Grant Ave., Edison, N.J. 08817, and Frederic Leder, 1635 Reefview Cir., Corona Del Mar, Calif. 92625

Filed Jan. 5, 1978, Ser. No. 867,209
Int. Cl.[2] C10G *21/16, 21/28*
U.S. Cl. 208—321 **11 Claims**



1. A process for the separation of aromatic and paraffinic hydrocarbon constituents of an aromatic-containing petroleum distillate which comprises the steps of

(1) contacting the petroleum distillate at a temperature of about 150°–450° F. with a solvent comprising a mixture of methanol and water in which the water comprises at least 10% by volume to produce an aromatic-rich extract phase and a paraffinic-rich raffinate phase;

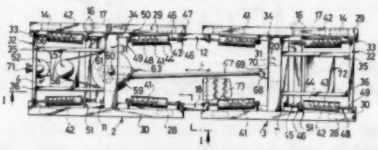
(2) separating the aromatic-rich extract phase from the paraffinic-rich raffinate phase; and

(3) contacting the separated aromatic-rich extract phase and paraffinic-rich raffinate phase directly, without further processing, with water to result in a water/methanol solvent containing at least 80% water by volume, thereby separating said aromatic-rich extract phase and paraffinic-rich raffinate phase from their respective solvent streams and recovering as products a paraffinic-rich hydrocarbon stream and an aromatic-rich hydrocarbon stream.

4,179,363
DUAL-TABLE SEPARATING APPARATUS

Kurt Schnellbacher; Klaus Müller, and Frank-Otto Görlitz, all of Braunschweig, Fed. Rep. of Germany, assignors to Buhler-Miag GmbH, Braunschweig, Fed. Rep. of Germany

Continuation of Ser. No. 782,832, Mar. 30, 1977, abandoned. This application Aug. 17, 1978, Ser. No. 934,549
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614247; Oct. 28, 1976, 2648950
Int. Cl.[2] B07B *13/10*
U.S. Cl. 209—481 **26 Claims**



1. A separating apparatus for particulate material, especially for separating shelled grain from unshelled grain in dependence on the different elasticity of these grains, said apparatus comprising a frame defining a generally horizontally longitudinal direction; a front separating table on said frame; a rear separating table on said frame spaced longitudinally from said front table, each of said tables being provided with a plurality of separating chambers extending transverse to said direction and each having an inclined bottom and zig-zag baffles; means supporting said tables on said frame for independent linear displacement only in said longitudinal direction; a link extending at least generally in said direction and having a rear end connected to said rear table and a front end; biasing means for each of said tables for urging the same into a respective rest position; drive means completely supported on said front separating table and having an output end connected to said front end and limitedly reciprocable in said direction relative to said front separating table for limitedly longitudinally displacing said link and thereby oppositely longitudinally and linearly displacing said tables; a counterweight on said rear separating table dimensioned so that the mass of said front separating table including said drive means is substantially equal to that of said rear separating table including said counterweight; and stabilizing means including a stabilizing element secured to said frame for coupling said tables longitudinally together in such a manner that longitudinal displacement of said front table in one longitudinal direction through a predetermined first distance is matched by displacement of said rear table in the opposite longitudinal direction through a predetermined second distance bearing a fixed ratio to said first distance.

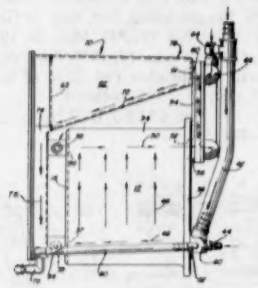
4,179,364
DIFFUSION DEVICE FOR BLOOD

William R. Bratten, Antioch, and Joel N. Helfer, Buffalo Grove, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 5, 1978, Ser. No. 903,314
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 B **8 Claims**

1. In a diffusion device for blood having as a diffusion means a flexible, semi-permeable membrane folded into a stack to provide a plurality of membrane layers arranged for flow of blood in a plurality of parallel first flow paths and for flow of another fluid in a plurality of parallel second flow paths positioned between and separated from said first flow paths by said membrane, and a stiff, integral backing having transversely extending, generally parallel score lines and folded on said score lines into sections and arranged on one side of said membrane in said second flow paths for support of said layers and spaced port means defined in said backing to permit fluid flow therethrough, the improvement comprising: laterally positioned tabs on each edge of the stiff backing, said tabs being

folded inwardly against inner portions of said backing and sealed thereto to provide double thickness edge portions of



said backing, to provide a spacing and gasket seal at opposed edges of said stack.

4,179,365

PROCESS FOR TREATING WASTE WATER

Etsuo Sumi, Fujieda, Japan, assignor to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Oct. 19, 1978, Ser. No. 952,911

Claims priority, application Japan, Oct. 28, 1977, 52-128647

Int. Cl.[2] C02C *1/06, 5/10;* **B01D** *11/04*

U.S. Cl. 210—8 **4 Claims**

1. A process for treating a waste aqueous stream containing greater than 10,000 ppm of free phenols which comprises the steps of:

(1) subjecting said waste stream to a solvent extraction process or an adsorption process to reduce the phenol content of the waste stream to less than 100 ppm,

(2) treating the waste aqueous stream resulting from step (1) in a conditioning zone with nutrients and adjusting the concentration, pH and temperature of said waste aqueous stream to be within a pH range of about 6.4 to 7.6, a temperature range of about 15° to 35° C., and BOD range of about 350 to 800 ppm,

(3) agitating the aqueous stream from step (2) in an aerating zone in contact with activated sludge containing aerobic bacteria, and

(4) settling the activated sludge from the aqueous stream from step (3) to provide a purified water stream.

4,179,366

METHOD FOR THE BIOLOGICAL PURIFICATION OF EFFLUENT AND THE PLANT FOR CARRYING OUT THE PROCESS

Joseph R. Kaelin, Buochs, Switzerland, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 745,567, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 585,572, Jun. 10, 1975, abandoned. This application Aug. 2, 1978, Ser. No. 930,136

Claims priority, application Switzerland, Nov. 18, 1974, 15346/74

Int. Cl.[2] C02C *5/10*

U.S. Cl. 210—14 **3 Claims**

1. An activated sludge wastewater treatment process comprising:

(a) providing a first tank, an intermediate tank and a final tank;

(b) serially hydraulically interconnecting the tanks below normal wastewater surface level therein;

(c) feeding wastewater to be treated into said first tank;

(d) aerating the contents of said first tank and said intermediate tank so as to maintain activated sludge present and in suspension in said first tank and intermediate tank;

(e) flowing aerated wastewater from said first tank serially through said intermediate tank to said final tank, so that during the course of treatment activated sludge continuously declines in concentration in said first tank and intermediate tank and continually increases in concentration in said final tank;

(f) settling sludge from the wastewater in said final tank;

(g) removing sludge-depleted wastewater from the final tank as treated effluent from the process;

(h) discontinuing said feeding of wastewater into the first tank, the aeration of said first tank contents and the removal of treated wastewater from said final tank when the concentration of activated sludge in said first tank has been reduced to a first predetermined value;

(i) feeding wastewater to be treated into said final tank while continuing the aeration of the intermediate tank contents but without removal of wastewater from any of said tanks during a time sufficient to permit settling of activated sludge in said first tank;

(j) when activated sludge in said first tank has settled to a predetermined extent, initiating aerating of the contents of the final tank, with the aeration of the intermediate tank continuing, so as to maintain activated sludge present and in suspension in said final tank and intermediate tank;

(k) flowing aerated wastewater from said final tank serially through said intermediate tank to the first tank, so that during the course of treatment activated sludge continuously declines in concentration in said final tank and intermediate tank and continually increases in concentration in said first tank;

(l) settling sludge from wastewater in said first tank;

(m) removing sludge-depleted wastewater from the first tank as treated effluent from the process;

(n) discontinuing the feed of wastewater into the final tank, the aeration of said final tank contents and the removal of treated wastewater from the first tank when the concentration of activated sludge in said final tank has been reduced to a second predetermined value;

(o) feeding wastewater to be treated into said first tank while continuing the aeration of the intermediate tank contents but without removal of wastewater from any of said tanks during a time sufficient to permit settling of activated sludge in said final tank;

(p) reinitiating aerating of the contents of the first tank while continuing the aeration of the second tank contents so as to maintain activated sludge present and in suspension in said first tank and intermediate tank;

(q) thereafter repeating steps (e) to (p) in sequence.

4,179,367

THICKENING URINARY AND INTESTINAL TRACT EXCREMENT

Eduard Barthell, and Otto Schmid, both of Krefeld, Fed. Rep. of Germany, assignors to Chemische Fabrik, Bakerpfad, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,824

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 2706135

Int. Cl.[2] C02B *1/14;* **B01D** *15/00*

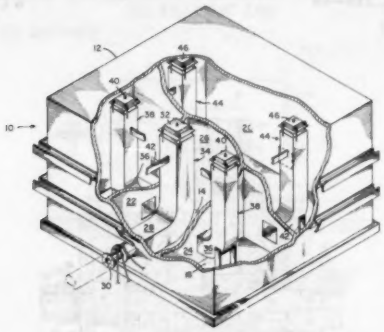
U.S. Cl. 210—41 **7 Claims**

1. A method of thickening urinary tract and intestinal excrement comprising mixing said excrement with about 1 to 5 grams of a cross-linked water-swelling polymer per 100 ml of excrement and with about 0.1–0.5 parts of a hydrophilic adsorption agent per part by weight of polymer.

4,179,368
G-FACTOR COMPENSATED HYDRAULIC FLOCCULATION SYSTEM

Roderick M. Willis, 2624 W. Crockett St., Seattle, Wash. 98199

Filed Apr. 28, 1978, Ser. No. 901,255
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—42 R **16 Claims**



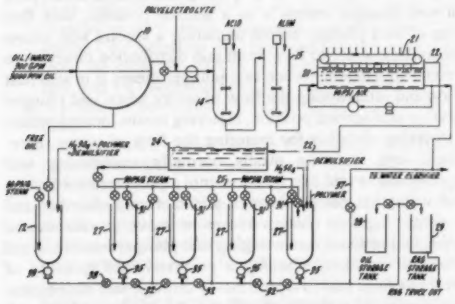
1. A method of compensating for variations in flow rate of a treated liquid through a hydraulic flocculation system having an orifice through which said liquid flows, comprising automatically adjusting the effective size of said orifice in accordance with said flow rate in order to maintain the head loss across said orifice and the G-factor of said flocculation system substantially constant as said flow rate varies.

8. A hydraulic flocculation system, comprising:
a detention tank having a discharge port;
an orifice opening into said tank;
constant pressure-loss valve means position adjacent said orifice receiving a liquid containing a flocculation chemical for maintaining a constant head loss across said orifice thereby maintaining the G-factor of said system substantially constant with variations in flow rate of said liquid through said system.

4,179,369
POLYMER TO AGGLOMERATE RESOLVED EMULSIONS

Robert L. Bradley, Lake Hiawatha, N.J., and Frank A. Mauceri, Clarendon Hills, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 550,858, Feb. 18, 1975, abandoned. This application May 10, 1978, Ser. No. 903,771
Int. Cl.[2] B01D *17/04*
U.S. Cl. 210—43 **5 Claims**



1. A method of resolving an emulsified oily sludge, in which oil is the external phase, to separate an oil phase and a water phase during agitation of the sludge while it is hot, at least about 180° F., and comprising treating the sludge with at least about 4500 ppm of a demulsifying agent to break the emulsion and adding at least about 200 ppm of an acrylamide polymer concurrently to retard re-emulsification for a protracted period of time, adding about ½ to 2% acid, and separating said phases, during said time period, said demulsifying agent being selected from the group consisting of ethoxylated amines, ethoxylated fatty alcohols, sulfo succinates, and salts of sulfonic acid, and said polymer being polyacrylamide or acrylamide copolymer which hydrolyzes to polyacrylic acid of molecular weight 5×10^5 to 10^7.

4,179,370
FLOCCULATING AGENT COMPRISING WATER-IN-OIL EMULSION OF STABILIZER PLUS NH-ACTIVE POLYMER CARRYING FORMALDEHYDE AND AMINE RADICALS

Wolfgang Hübner, Kempen; Eduard Barthell, Krefeld, and Kurt Dahmen, Mönchen-Gladbach, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhause & Cie, Krefeld, Fed. Rep. of Germany

Division of Ser. No. 682,543, May 3, 1976, Pat. No. 4,113,685, which is a continuation-in-part of Ser. No. 538,428, Jan. 2, 1975, Pat. No. 4,093,542, which is a continuation-in-part of Ser. No. 485,474, Jul. 3, 1974, abandoned. This application Jul. 10, 1978, Ser. No. 923,423
Claims priority, application Fed. Rep. of Germany, May 6, 1975, 2520028
Int. Cl.[2] B01D *21/01;* **C02B** *1/20*
U.S. Cl. 210—51 **11 Claims**

1. In the process of clarifying an aqueous liquid having material suspended therein comprising mixing said aqueous liquid with a settling composition, and allowing said mixture to settle, whereby the suspended material settles out more rapidly than in the absence of said composition, the improvement which comprises employing as said settling composition a stable dispersion of about 10 to 50% concentration by weight of a water-soluble polymeric Mannich base in a mixture of water, a water-insoluble liquid, a quantity of an emulsifier of a suitable HLB number effective to produce a stable water-in-oil emulsion, the Mannich base comprising an NH active polymer carrying carbonamide groups reacted with formaldehyde and a primary or secondary alkyl-or hydroxylakylamine wherein the alkyl groups have up to about 18 carbon atoms, said formaldehyde and said amine being employed in the reaction in approximately equimolar amounts and said formaldehyde being present in at least about 0.1 times the molar amount of the carbonamide groups, and a stabilizing member selected from the group consisting of
(a) a water-soluble salt of an amine,
(b) (a)in admixture with an amine,
(c) (a)in admixture with ammonia,
(d) an ammonium salt of a mineral acid plus ammonia, and
(e) a carboxylic acid amide.

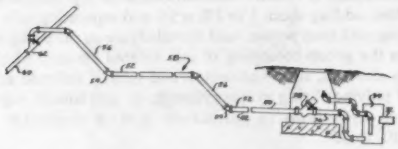
4,179,371
VACUUM SEWAGE SYSTEM

Brian E. Foreman, and Mark A. Jones, both of Rochester, Ind., assignors to Burton Mechanical Contractors, Inc., Rochester, Ind.

Filed Mar. 20, 1978, Ser. No. 890,581
Int. Cl.[2] B01D *1/00*
U.S. Cl. 210—63 R **6 Claims**

1. An improved vacuum sewage system for transporting sewage from a source at a given air pressure comprising:
vacuum collection means for receiving sewage and having a pressure less than the pressure of the source;
sewage injection means having an inlet coupled to the source of sewage and having an outlet for injecting the sewage and air; and
conduit means coupled to the vacuum collection means and coupled to the outlet of the injection means, said conduit

means having at least one riser, low point, and downslope, and being laid out in sawtooth fashion between the collection means and the injection means outlet so that when no



flow occurs sewage collects in the low point and permits the same pressure to be distributed throughout the conduit means.

4,179,372

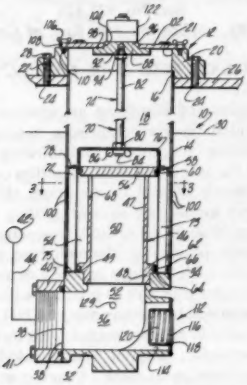
FLUID FILTERING DEVICE

Nils O. Rosaen, 7108 Bridge Way, W. Bloomfield, Mich. 48033

Filed Nov. 8, 1978, Ser. No. 958,670

Int. Cl.[2] B01D *35/14*

U.S. Cl. 210—90 **10 Claims**



1. A fluid filtering device for use with a fluid reservoir in which fluid is contained substantially at a predetermined level, said filtering device comprising:

an elongated tubular cylindrical main housing having a fluid outlet means formed at one end;

means for securing said main housing to the fluid reservoir so that a portion of the main housing is positioned below the reservoir fluid level;

fluid inlet means formed through said housing to establish fluid communication between said reservoir and the interior of said housing;

an annular housing member coaxially disposed in said main housing and below the reservoir fluid level, said housing member being spaced radially inwardly from said main housing and forming an annular chamber therebetween, the lower portion of said housing member being connected to said main housing so that the interior of the housing member is open to the fluid outlet means, fluid passage means formed through the housing member for establishing fluid communication between said annular chamber and said outlet means and means for closing the upper end of the housing member;

a filter assembly comprising:

a tubular filter element and means for positioning said filter element in said annular chamber; and

means for sealing both the upper and lower ends of the housing member to said filter element.

4,179,373

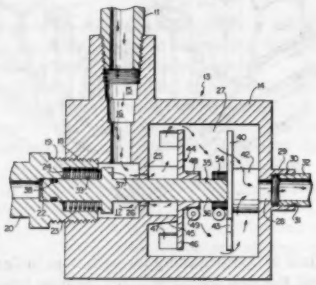
SHUTOFF AND BYPASS VALVE

Milan Sablich, Bloomfield Hills, and Eugene J. Bedard, Detroit, both of Mich., assignors to Consolidated Foods Corporation, Old Greenwich, Conn.

Filed Sep. 14, 1978, Ser. No. 942,242

Int. Cl.[2] B01D *35/00*

U.S. Cl. 210—98 **6 Claims**



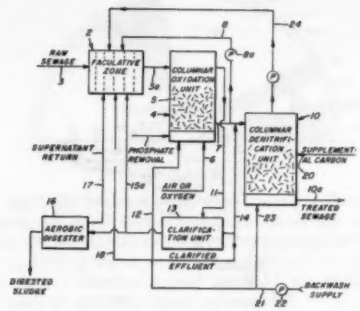
6. A shutoff and bypass valve apparatus for use in a water supply system having a water purifier means and an appliance which uses water, comprising a body having wall structure defining a hollow distribution chamber and a separate metering chamber, an opening normally providing communication between said distribution chamber and said metering chamber, said distribution chamber communicating with an inlet port which is connected to a supply of water by a first pipe means, a first outlet port located in the wall structure of said metering chamber and a second outlet port located in the wall structure of said distribution chamber, second pipe means connecting said first outlet port to said purifier means and said appliance, third pipe means connecting said second outlet port of said appliance, plunger means extending through said opening and having a first portion located within said distribution chamber and a second portion located within said metering chamber, said first portion of said plunger means including a first seal means for closing said second outlet port when said plunger means is in a first position and opening said second outlet port when said plunger means is in a second position, said first portion of said plunger means including a second seal means for permitting water to flow from said distribution chamber to said metering chamber when said plunger means is in said first position and interrupting the flow of water when said plunger means is in said second position, metering means located within said metering chamber for metering the flow of water therethrough, said metering means normally maintaining said plunger means in said first position until a predetermined quantity of water has passed through said metering chamber and then permitting said plunger means to move to said second position, and resilient means urging said plunger means toward said second position, whereby a predetermined quantity of water flows from said first pipe means through said distribution chamber and said metering chamber and is discharged through said second pipe means and said purifier means to said appliance and thereafter, when said plunger means moves to said second position, the water flows from said distribution chamber through said third pipe means to said appliance.

4,179,374

APPARATUS FOR THE TREATMENT OF WASTEWATER

Elton S. Savage, Wexford, and Jeffrey J. Chen, Pittsburgh, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 685,770, May 12, 1976, abandoned, which is a division of Ser. No. 483,231, Jun. 26, 1974, abandoned. This application Oct. 18, 1977, Ser. No. 843,203
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—151 7 Claims



1. A sewage treatment plant comprising:

(a) an enclosed facultative unit arranged to simultaneously receive and contain a liquid mixture of raw sewage and sewage that is recycled after partial processing in the plant and having an effluent conduit for the discharge of said mixture therefrom and having inlet means for connection with a source of raw sewage;

(b) an enclosed columnar oxidizing unit comprising a deep bed filter with a filter bed therein arranged to receive the effluent from the facultative unit at a location where said effluent will percolate downwardly through the filter bed, said oxidizing unit having an inlet below said filter bed arranged for connection with a controlled flow of gas comprising oxygen or air which is discharged into the oxidizing unit to flow countercurrent to the downwardly percolating effluent from the facultative unit, and means arranged to provide an effluent outlet after it has percolated through said filter bed;

(c) said columnar oxidizing unit being provided with means for backwashing the filter bed with water, and means arranged to digest and remove sludge from the spent backwash water after its passage through the filter bed and recycle at least part of the partially treated sewage after removal of the sludge therefrom to the facultative unit;

(d) conduit means arranged to conduct part of the effluent from said effluent outlet of the oxidizing unit into the facultative unit while excluding contact thereof with ambient air whereby the dissolved oxygen carried over from the oxidizing unit in the mixture in the facultative unit may be maintained below a preselected level;

(e) a columnar denitrification unit in the nature of a deep bed filter;

(f) conduit means for discharging that portion of the effluent from the oxidizing unit which is not returned to the facultative unit into the upper end of the denitrification unit to percolate down through the filter bed of said unit for effecting denitrification of dissolved nitrates in the downflowing liquid by establishment and growth of facultative microorganisms in the filter bed of the said denitrification unit, said columnar denitrification unit having an outlet below the filter bed for the discharge of the filtered effluent; and

(g) backwashing means to effect the reverse flow of wash water through the filter bed of the denitrification unit and outlet means above the filter bed for removing the spent backwash water from the filter bed and conducting at least a portion of the backwash water along with facultative bacteria removed by such backwashing into the facultative zone to replenish facultative bacteria in the facultative zone that are removed with the effluent liquid mixture from the facultative zone or otherwise destroyed; and

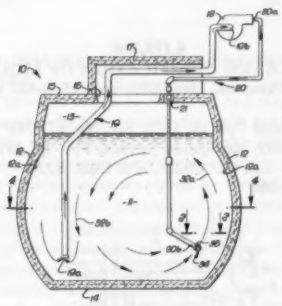
(h) conduit means leading from above the filter bed of the columnar oxidation unit for the removal of spent backwash water therefrom and comprising means to digest and remove entrained sludge therefrom and recycle the water to the facultative zone.

4,179,375

AERATION OF WASTE IN SEPTIC TANK

Alvin J. Smith, 228 Cordova Dr., Santa Barbara, Calif. 93109

Continuation of Ser. No. 823,622, Aug. 11, 1978, abandoned. This application Oct. 23, 1978, Ser. No. 953,475
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—197 4 Claims



1. In an aerated sewage disposal system to aerate sewage waste in a septic tank having walls curved to aid in causing a revolving flow of waste and including said tank having opening means in the top of the tank above the level of said waste, the combination comprising

(a) ducting means to effect flow of waste from the tank, and to effect return flow of said waste to the tank,

(b) additional means connected to said ducting means to effect entry of oxidizing fluid into the waste flow of said ducting means,

(c) said first means including distributed outlet means in the tank to discharge said oxidizing fluid in the form of small bubbles into the waste in the tank along with return of the flowing waste into the tank,

(d) said ducting means including a pump, a suction line extending through said opening means and having an intake end extending into waste in the tank and a discharge end, a return line in the form of piping extending through said opening means and having an intake end and an opposite end extending into the tank and connected to the distributed outlet means, the pump operable to effect flow of waste between the suction line discharge end and the return line intake end, said means to effect entry of oxidizing fluid into the waste flow connected to the return line above the level of waste in the tank to effect said entry of oxidizing fluid into the waste flowing in the return line to mix therewith as the waste flows downwardly in said return line in the tank, said distributed outlet means located in the tank to create a revolving flow of waste upwardly and downwardly in the tank,

(e) said distributed outlet means being openly unconfined within the tank and including at least one elongated slit through a duct side wall defined by the distributed outlet means, the slit extending lengthwise of said duct and lengthwise of the tank so as to be substantially parallel to the axis of rotation of the revolving flow, the duct consisting of expandable material and characterized in that the

slit widens in response to application of pressure to waste liquid flowing in the duct, the slit being closed in the absence of pressure application to said waste liquid within said distributed outlet means, the slit located at generally the same lower interior level in the tank as the intake end of the suction line,

(f) said return line extending downwardly from said opening and toward said distributed outlet means whereby pressurized waste in said return line exerts pressure sufficient to effect opening of said slit,

(g) said slit located proximate one interior curved side of the tank, and said intake end of the suction line located proximate another interior curved side of the tank which faces oppositely toward said one side of the tank.

4,179,376

DEVICE FOR PURIFICATION OF LIQUIDS

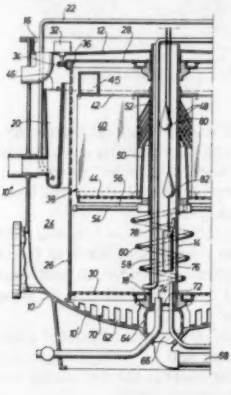
Lars Å. H. Håkansson, Lindöhällsvägen 15, S-603 65 Norrköping, Sweden

Filed Feb. 14, 1978, Ser. No. 877,749

Claims priority, application Sweden, Feb. 16, 1977, 7701734

Int. Cl.[2] C02B *1/20*; C02C *1/34*

U.S. Cl. 210—208 **8 Claims**



1. Device for purification of liquids, especially waste water from industrial processes, and including a flocculation chamber (20) having means (22) for supply of a flocculant, a precipitation or sedimentation chamber (24) for separation of the precipitate and a filter unit (38) for further purification of the liquid from the precipitation or sedimentation chamber (24), characterized in that the filter unit is arranged as an annular filter array (38) having substantially radially arranged, inclined lamellas (40), said filter array being slidably and rotatably arranged on a vertical outlet tube (14) in the precipitation or sedimentation chamber (24) and is provided with a float member 45, which keeps the filter array (38) in predetermined height relative to the surface of the liquid in the precipitation or sedimentation chamber (24), that the flocculation chamber (20) comprises an annular, upwardly open channel, which is arranged around the filter array (38) in the precipitation or sedimentation chamber (24), and in that a cylindrical casing (26) having apertures is arranged between the filter array (38) and the annular flocculation chamber (20), said casing being arranged to slowly rotate around the outlet tube (14) and being provided with the driving means, so that the filter array (38) follows the casing (26) in its rotational movement.

4,179,377

SHIFTING DEVICE FOR A PLATE FILTER PRESS

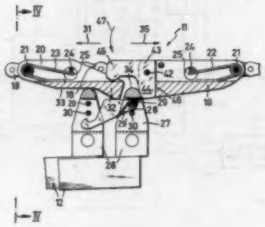
Alfons Schotten, Düren, and Hermann J. Spölgen, Langerwehe, both of Fed. Rep. of Germany, assignors to Eberhard Hoesch & Söhne GmbH & Co., Düren, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,284

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2728997

Int. Cl.[2] B01D *25/00*

U.S. Cl. 210—230 **8 Claims**



1. In a plate filter press having a horizontal guide carrier; a plurality of filter plates shiftably supported on the guide carrier; a projection affixed to each filter plate; a spring-loaded pivotal locking hook and a locking pin mounted on each projection for releasably locking adjoining filter plates to one another to form an interlocked filter plate stack; and a filter plate shifting device for dissolving the stack on a closed side of the press by successively displacing the filter plates on the guide carrier in a first direction toward an open side of the press; the filter plate shifting device including a carrier element supported for displacement parallel to the guide carrier and driving means for selectively moving the carrier element in said first direction and in a second direction oriented opposite to said first direction; the improvement in said filter plate shifting device comprising

(a) a shifting lever pivotally secured to said carrier element for swinging into and out of a depressed position, said shifting lever being oriented in said first direction and having a free end arranged to abut the projection of a filter plate to be shifted and moving the last-named filter plate in said first direction when said drive means moves said carrier element in said first direction;

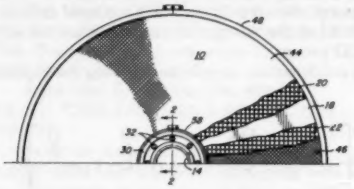
(b) a reversing lever pivotally secured to said carrier element at a location spaced in said first direction from the articulation between said shifting lever and said carrier element; said reversing lever being oriented in said second direction and having a free end; the respective free ends of said shifting lever and said reversing lever being oriented towards one another; and

(c) a bell crank lever pivotally mounted on the free end of said reversing lever and having a first end for cooperating with the projection of the filter plate to be shifted and a second end for cooperating with a portion of said shifting lever; said bell crank lever being arranged to abut, with said first end, the projection of the filter plate to be shifted, whereby the filter plate to be shifted is urged in said second direction and said bell crank lever is urged into an operative pivotal position depressing said shifting lever when said drive means moves said carrier element in said second direction for effecting a disengagement of the locking hook of the filter plate to be shifted from the cooperating locking pin of the adjoining filter plate.

4,179,378
FILTER LEAF

Earl A. Borre, Itasca, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill. and Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Jun. 7, 1978, Ser. No. 913,482
Int. Cl.[2] B01D *33/26*
U.S. Cl. 210—232 **6 Claims**



1. For use in the pressure chamber of a pressure filter having a tubular, liquid outlet manifold disposed therein and on which a plurality of filter leaves are mounted in juxtaposed relationship for entraining solids from a liquid passed through said leaves from said chamber to said manifold, the combination wherein each of said filter leaves includes:

a generally planar supporting and drainage core,

a pair of axially aligned mounting rings forming the hub of the associated leaf, filter media mounted over said core sealably clamped to said hubs,

means for clamping the supporting and drainage core of each leaf between the associated mounting rings,

at least one of said rings having an annular groove in the circumferential surface thereof,

a resilient sealing gasket mounted in said groove, and

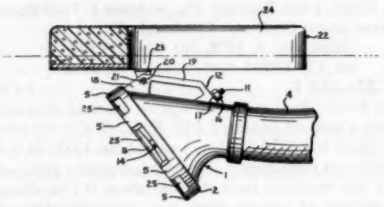
a rigid, tubular, imperforate cylindrical member extending over said gasket in sealing relationship therewith and being sealably connected to the mutually adjacent ring of the next adjacent filter leaf,

whereby the juncture between adjacent filter leaves is sealed by said cylindrical member from the chamber in which said filter leaves are disposed.

4,179,379
PICK-UP NOZZLE

Robert D. Mitchell, Fond du Lac, Wis., assignor to Firl Industries, Inc., Fond du Lac, Wis.

Filed Feb. 23, 1978, Ser. No. 880,433
Int. Cl.[2] B01D *35/28*
U.S. Cl. 210—242 R **4 Claims**

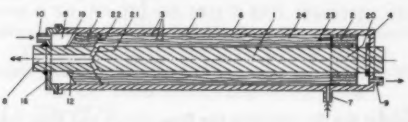


1. A pickpup nozzle comprising a tapered generally tubular body having its upper smaller end adapted to be connected to a suction conduit and disposed at an angle to the flat base of the lower larger end, a filter screen disposed across said base, means extending downwardly from the upper side of the inclined nozzle body and connecting centrally of said screen to suspend the same, a lug on said nozzle body above said base and forward of said small end, a float having a bracket beneath the same complementary to said lug, and a removable pivot means connecting said lug and said bracket to pivotally suspend said nozzle body from said float, said float having a recess therein to accommodate said nozzle body in upward pivoting position.

4,179,380
HOLLOW FIBRE APPARATUS

Charles Amicel, Carrieres sur Seine; Bernard Biot, Craponne; Yves Butruille, Ferrol-Attilly, and Christian Ollivier, Vienne, all of France, assignors to Sodip S.A., Meyzieu, France

Filed Dec. 27, 1977, Ser. No. 865,097
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 A **15 Claims**



1. Hollow fibre apparatus for the fractionation of fluids which comprises,

a mandrel towards the ends of which two sealing elements are situated which surround the said mandrel and by which the hollow fibres are held, the fibres extending from one sealing element to the other, at least one of these sealing elements being traversed by the hollow fibres so that open ends thereof are exposed at an outer side thereof and having an inner side opposite to the inner side of the other sealing element which is inclinded at least in part with respect to the longitudinal axis of the mandrel, the said at least one sealing element with an inner side inclined comprising a ribbon means enrolled around the said mandrel, the end part of the fibres being held in a leaktight manner between the spirals of the ribbon means,

a casing which is arranged at least around the hollow fibres and the sealing elements and which defines, between its inner wall, the inner sides of the sealing elements and the mandrel, a chamber in which the hollow fibres are arranged,

first inlet and/or outlet means for introducing and/or withdrawing fluid which is circulated inside the hollow fibres, and second inlet and outlet means for introducing and withdrawing of fluid which is circulated outside the fibres inside the chamber.

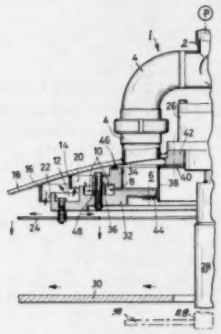
4,179,381
INTAKE DISTRIBUTOR FOR A SETTLING TANK FILTER

Rolf Baur, Heubach-Lautern, Fed. Rep. of Germany, assignor to Schenk-Filterbau Gesellschaft mit beschränkter Haftung, Waldstetten, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,201
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752486
Int. Cl.[2] B01D *29/42*
U.S. Cl. 210—456 **12 Claims**

1. An inlet distributor for a settling tank filter, which includes: a vertical shaft arranged centrally and adapted to receive horizontally extending filter elements one above the other, annular chamber means coaxially arranged with regard to said vertical shaft, inlet conduit means spaced at equal angles from each other and leading into said annular chamber means, said annular chamber means having an annular slot associated therewith for fluid communication with said tank filter, said annular slot being coaxial with said vertical shaft, and having a flow cross section relatively small with regard to the flow

cross section of said inlet conduit means, and deflecting means arranged in fluid communication with and located outside of



said annular slot for reducing the flow energy and flow velocity of fluid from said annular chamber means.

4,179,382

TEXTILE CONDITIONING COMPOSITIONS CONTAINING POLYMERIC CATIONIC MATERIALS

Arthur L. Rudkin, Hitchin; John H. Clint, and Kenneth Young, both of Whitley Bay, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 27, 1978, Ser. No. 955,559
Int. Cl.[2] D06M *13/26*
U.S. Cl. 252—8.8 **11 Claims**

1. A textile conditioning composition comprising:

(a) a cationic textile softening agent having either one alkyl or alkenyl group with at least 16 carbon atoms or two alkyl or alkenyl groups having from 10 to 22 carbon atoms,

(b) from 0.001 to 0.70% by weight of a polymeric cationic salt or mixture of such salts selected from the group consisting of

(i) cationic polysaccharide gums,

(ii) cationic starch and starch derivatives

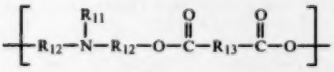
(iii) polyvinyl pyridine and polyvinyl pyridinium salts and co-polymers therewith,

(iv) cationic polyvinyl alcohol,

(v) cationic polyvinyl polyvinyl pyrrolidone co-polymers

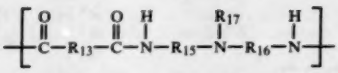
(vi) co-polymer of dialkylaminoalkyl methacrylate, wherein each alkyl has 1–3 carbon atoms, with styrene, or a neutral acrylic ester,

(vii) condensation co-polymers having the repeating unit



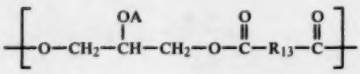
wherein R_{11} is hydrogen or a C_{1-6} alkyl group, or is $R_{12}OA$, wherein A is a hydrogen or a C_{1-20} acyl group or a quaternary nitrogen-containing group, each R_{12} independently is a C_{1-6} alkylene group, and R_{13} is a C_{1-6} alkylene, hydroxy alkylene or alkenylene group or an arylene group said co-polymer being rendered cationic either by the presence of said quaternary group in some or all of radicals A, or by rendering some or all of the nitrogen atoms in the back bone cationic, or by both,

(viii) condensation co-polymers having the repeating unit



wherein R_{13} is a C_{1-6} alkylene hydroxyalkylene or alkyl or an aryl group, R_{15} and R_{16} independently are a C_{1-6} alkylene group, and R_{17} is hydrogen or a C_{1-6} alkyl group, said co-polymer being rendered cationic at some or all of the nitrogen atoms which are not adjacent to CO groups,

(ix) condensation co-polymers having the repeating unit



wherein R_{13} is a C_{1-6} alkane, hydroxy alkane or alkene residue or an aryl group and some or all of radicals A are quaternary nitrogen-containing groups the remainder being hydrogen atoms, and

(x) quaternised polyethyleneimines having at least 10 ethyleneimine residues in the molecule, and (c) optionally a substantially water-insoluble nonionic textile conditioning agent, in amount such that the weight ratio of component (c), if present, to components (a) and (b) together is not greater than 1:10.

4,179,383

PREPARATION OF MAGNESIUM-CONTAINING DISPERSIONS FROM MAGNESIUM CARBOXYLATES

William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 7, 1977, Ser. No. 840,192
Int. Cl.[2] C10M *1/40, 1/24, 3/34, 3/18*
U.S. Cl. 252—25 **16 Claims**

1. A process of preparing a stable, fluid magnesium-containing dispersion which comprises substantially quantitatively decomposing a magnesium carboxylate to MgO in a non-volatile process fluid capable of being heated to the decomposition temperature of the magnesium carboxylate also containing a dispersant capable of retaining the magnesium oxide formed by the decomposition in stable suspension at a temperature between about 230° C. and about 400° C.

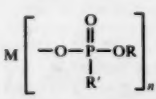
4,179,384

STABILIZED HYDRAULIC FLUID

James T. Mann, Plum Borough, Pa., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Nov. 9, 1978, Ser. No. 959,307
Int. Cl.[2] C10M *1/48, 1/46, 3/42, 3/40*
U.S. Cl. 252—32.7 E **5 Claims**

1. A hydraulic fluid stabilized against thermal degradation comprising a base oil having a 100° F. (37.8° C.) viscosity of between about 100 SUS (20.6 cs.) and about 1,000 SUS (215 cs.) and selected from highly refined mineral oils, alpha-olefin oligomers and mixtures thereof; from about 0.1 to about 2.0 volume percent of one or more zinc bis(dialkyldithiophosphate)s in which the alkyl groups have between about four and about twelve carbon atoms; and from about 0.01 to about one volume percent of an alkali metal or alkaline earth metal phosphonate having the general formula



in which M is an alkali metal or alkaline earth metal, n is the valence of the metal, R is lower alkyl having one to about four carbon atoms and R′ is higher alkyl having from about 10 to about 30 carbon atoms, or a mixture of said phosphonates.

4,179,385

PROCESS FOR THE PRODUCTION OF OVERBASED MANGANESE SALTS OF ORGANIC ACIDS

Asghar Ali, Edison; Robert Caruso, Westfield, both of N.J.; Alfred Fischer, Forest Hills, N.Y.; Adolph J. Deinet, East Brunswick, N.J.; Pasquale P. Minieri, Woodside, N.Y., and Henri Sidi, Paramus, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 3, 1978, Ser. No. 902,464

Int. Cl.[2] C10M *1/40, 1/24, 3/34;* **C10L** *1/24*

U.S. Cl. 252—33 **16 Claims**

1. In the process for the production of overbased manganese salts of organic acids that comprises contacting with carbon dioxide at a temperature in the range of 50° C. to 100° C. until the carbonation reaction is complete a reaction mixture that comprises (1) excess manganous oxide, (2) an organic acid selected from the group consisting of oil-soluble organic carboxylic acids and oil-soluble organic sulfonic acids, (3) a promoter selected from the group consisting of ammonium halides, ammonium nitrate, mono, di-, and trihydrocarbyl amine hydrohalides containing 1 to 3 carbon atoms, ammonium sulfide, and ammonium peroxysulfate, (4) a copromoter selected from the group consisting of alkaline earth halides, aluminum chloride, and ferric chloride, and (5) a solvent system containing from 10% to 90% by weight of an alcohol having from 1 to 18 carbon atoms and from 10% to 90% by weight of an inert solvent selected from the group consisting of hydrocarbons, halogenated hydrocarbons, and mixtures thereof, wherein the proportion of promoter and copromoter is from 2% to 20%, based on the weight of manganous oxide, and the amount of the solvent system is that which will produce a product that contains from 2% to 10% by weight of manganese, the improvement that comprises carrying out the carbonation reaction at a pressure in the range of 1 atmosphere to 10 atmospheres in the presence of from 0.3% to 0.8% of water, based on the weight of the solvent system in the reaction mixture.

4,179,386

SYNTHETIC AIRCRAFT TURBINE OIL

Russell R. Reinhard, Hopewell Junction, and Roberta Yaffe, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 30, 1978, Ser. No. 910,719

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—46.6 **10 Claims**

1. A synthetic lubricating oil composition consisting of a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol or a polypentaerythritol or trimethylolpropane and an organic monocarboxylic acid having from about 2 to 18 carbon atoms per molecule and:

(a) from about 0.25 to 10 percent by weight of a hydrocarbyl phosphate ester in which said hydrocarbyl radical contains an aryl ring and contains from about 16 to 18 carbon atoms, and

(b) from about 0.01 to 0.5 percent by weight of a polyhydroxy-substituted anthraquinone,

(c) from about 0.10 to about 5.0 percent by weight of a dialkyl sulfide compound having the following formula:

$$R_1—S—R^1$$

wherein R and R^1 each can be a C_1–C_{14} straight chain or branched chain alkyl group or mixtures thereof,

and either one of the following classes of compounds

(1) from about 0.3 to 5 percent by weight of the lubricating oil composition of a phenylnaphthylamine or an alkyl or alkaryl phenyl naphthylamine in which the alkyl radical has from 4 to 12 carbon atoms, or

(2) from about 0.3 to 5 percent by weight of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms.

4,179,387

PROCESS FOR PRODUCING MAGNETIC FE OXIDE

Koji Sasazawa; Mahito Shimizu, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 792,956, May 2, 1977, abandoned, which is a continuation of Ser. No. 557,431, Mar. 11, 1975, abandoned. This application Dec. 21, 1977, Ser. No. 862,884

Claims priority, application Japan, Mar. 12, 1974, 49-28423

Int. Cl.[2] C04B *35/26;* **C01G** *49/06, 49/08*

U.S. Cl. 252—62.56 **5 Claims**

1. A process for producing a magnetic Fe oxide having a coercive force of at least about 300 Oe and and optionally an element selected from the group consisting of Mg, Cu, Cr, Mn, Ni, Zn, Mo, Sn, Sb, Te, Rh, Ba, La, Ce, W, Bi and mixtures thereof, the amount of the element plus the Co being from about 0.5 to 33 atomic %, in which the oxidation degree indicated by the following equation ranges from about 30% to 80%:

$$\text{Oxidation Degree} = \left(1 - \frac{300 - y}{100 - y} \cdot R\right) \times 100\ (\%)$$

wherein y is the amount of Co, plus divalent metal if present, in atomic % contained in the magnetic Fe oxide, and R is the ratio of the divalent Fe ions to the total Fe ions,

which comprises

(i) dehydrating goethite containing Co and optionally said element and (ii) reducing the dehydrated goethite containing Co, and optionally said element at a temperature of about 300° to 400° C., to obtain magnetite containing Co, and optionally, said element, followed by (iii) cooling the magnetite product of step (ii) to room temperature under a flow of nitrogen gas, (iv) covering the product of step (iii) with water, (v) removing excess water from the wet magnetite so that the magnetite particles produced in covering step (iv) have a moisture content of about 50 to 200% by weight relative to dried magnetite particles and (vi) oxidizing the magnetite at a relatively low temperature of less than 100° C. to form a magnetic iron oxide having said oxidation degree

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4,179,388

ELECTROSTATOGRAPHIC DEVELOPER WITH SMOOTH SURFACED CARRIER

Arthur W. Rahn; Lewis O. Jones, and Chin H. Lu, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

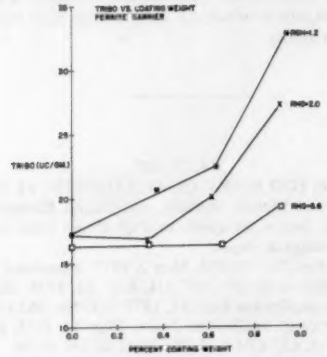
Filed Apr. 18, 1977, Ser. No. 788,482

Int. Cl.[2] G03G *9/10;* **B32B** *27/14*

U.S. Cl. 430—108 **8 Claims**

1. An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of classified carrier particles, said carrier particles having an average diameter of between about 30 microns and about 1,000 microns, said carrier particles having been classified as to have a surface roughness value of less than about 2.0 wherein said surface roughness value is defined as the ratio of

the BET area measured by gas absorption to that of the calculated geometric surface area of said carrier particles, and



wherein said carrier particles have a polymeric resin coating thereon.

4,179,389

STABILIZED HYDRAULIC FLUID

James T. Mann, Plum Borough, Pa., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Nov. 3, 1978, Ser. No. 957,654
Int. Cl.[2] C10M *1/48, 1/40, 3/42, 3/34*
U.S. Cl. 252—32.7 E **5 Claims**

1. A hydraulic fluid stabilized against thermal degradation comprising a base oil having a 100° F. (37.8° C.) viscosity of between about 100 SUS (20.6 cs.) and about 1,000 SUS (215 cs.) and selected from highly refined mineral oils, alpha-olefin oligomers and mixtures thereof; from about 0.1 to about 2.0 volume percent of a zinc bis(dialkyldithiophosphate) in which the alkyl groups have between about four and about twelve carbon atoms; and from about 0.01 to about one volume percent of a metal dialkylnaphthalene sulfonate in which the metal is selected from lithium, sodium, magnesium, calcium, barium and zinc and the alkyl groups contain between about six and about twenty carbon atoms.

4,179,390

LAUNDRY ADDITIVE PRODUCT

Gianfranco L. Spadini, and Ian D. Tolliday, both of Newcastle upon Tyne, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1977, Ser. No. 839,490
Claims priority, application United Kingdom, Oct. 6, 1976, 41491/76; May 13, 1977, 20213/77
Int. Cl.[2] C11D *3/395, 7/54*
U.S. Cl. 252—95 **6 Claims**

1. A method of making a laundry additive product for use as a bleaching aid, comprising the steps of

(a) forming a fluid mass containing organic peroxy bleach precursor; said organic peroxy bleach precursor being organic compound which is capable of reacting in aqueous washing liquor with inorganic peroxy bleach selected from the group consisting of alkali metal percarbonate, persilicate and perpyrophosphate bleaches to form organic peroxy bleach having a bleaching performance at least equivalent to that of the inorganic peroxy bleach;

(b) contacting flexible solid means with said fluid mass; said flexible solid means being suitable as a substrate for solidified fluid mass;

(c) causing fluid mass to solidify on said flexible solid means to provide a precursor:flexible solid means weight ratio lying within the range from about 30:1 to about 1:10; thereby forming laundry additive product for use as a bleaching aid consisting essentially of peroxy bleach precursor attached to flexible substrate and releasable in aqueous washing liquor by solution, dispersion, bleaching, softening or melting to react with said inorganic peroxy bleach to form said organic peroxy bleach.

4,179,391

PHOSPHATE-FREE TEXTILE DETERGENT, ESPECIALLY FOR WASHING AT TEMPERATURES OF OVER 75° C.

Jochen Kaufmann, Düsseldorf; Markus Berg, Düsseldorf-Holthausen, and Peter Krings, Krefeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 896,691
Claims priority, application Austria, Apr. 22, 1977, 2839/77
Int. Cl.[2] C11D *3/12, 3/36, 3/39, 3/60*
U.S. Cl. 252—99 **32 Claims**

1. A pulverulent, phosphate-free textile detergent consisting essentially of:

(a) from 25% to 35% by weight of a water-insoluble, finely-divided, synthetically-produced, crystalline alkali metal aluminosilicate containing at least some combined water and having primary particles in the size range of from 100μ to 0.01μ and a calcium binding power of from 50 to 200 mg CaO/gm of anhydrous active substance when measured at 22° C. by the Calcium Binding Power Test Method described in the specification and the formula on the anhydrous basis:

$$0.7\text{–}1.5\ Me_2O.Al_2O_3.1.3\text{–}2.4\ SiO_2$$

where Me is an alkali metal;

(b) from 5% to 17% by weight of a surface-active component selected from the group consisting of the combination (ba) consisting of:

(ba1) 1 part by weight of at least one nonionic surface-active agent which is an ethoxylated aliphatic C_{10}–C_{20} alcohol having a degree of ethoxylation of from 2 to 20;

(ba2) 0.3 to 1.75 parts by weight of a foam inhibitor selected from the group consisting of:

(i) an alkali metal soap of C_{12}–C_{22} fatty acids containing to an extent of more than 50% by weight, alkali metal salts of saturated C_{18}–C_{22} fatty acids, and

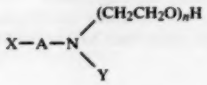
(ii) mixtures of said alkali metal soap with a non-surface-active foam inhibitor in proportions of soap to non-surface-active foam inhibitor within the range of from 25:1 to 2:1, and

(ba3) 0.5 to 6 parts by weight of an anionic surface-active agent selected from the group consisting of anionic surface-active sulfonates, anionic surface-active sulfates and mixtures thereof, and the combination (bb) consisting of:

(bb1) 1 part by weight of at least one nonionic surface-active agent from the group comprising the ethoxylated aliphatic C_{10}–C_{20} alcohols having a degree of ethoxylation of from 2 to 20;

(bb2) 0.05 to 0.75 parts by weight of a foam inhibiting alkali metal soap of C_{12}–C_{22} fatty acids containing, to an extent of more than 50% by weight, alkali metal salts of saturated C_{18}–C_{22} fatty acids, and

(bb3) 0.05 to 0.3 parts by weight of a compound having the formula:

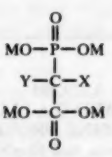


wherein X-A together represent a C_{10}–C_{18} fatty acid acyl, X represents a β-hydroxy-(C_8–C_{22})-alkyl having the attachment in the terminal or non-terminal position, and A is a bivalent linkage selected from the group consisting of a simple C—N bond, an aminoalkylene and a polyaminopo-

lyalkylene, which aminoalkylene or polyaminopolyalkylene may be substituted with polyethylene glycol ether groups, Y represents a member selected from the group consisting of hydrogen and the group $-(CH_2CH_2O)_m$-H, and n and m each represent a number of between 1 and 3,

(c) from 0.2% to 0.6% by weight of a water-soluble organic complex former selected from the group consisting of:

(i) diphosphonates having the formula:



wherein X is a member selected from the group consisting of hydroxy and amino, Y is a member selected from the group consisting of alkane having from 1 to 5 carbon atoms, aminoalkane having from 2 to 5 carbon atoms, hydroxyalkane having from 2 to 5 carbon atoms, phenyl, hydroxyphenyl, aminophenyl and halophenyl, and M is a member selected from the group consisting of hydrogen and alkali metal, and

(ii) aminotri-(lower alkylene phosphonic acid) and its alkali metal salts;

(d) from 15% to 30% by weight of a perborate releasing hydrogen peroxide in water,

(e) 2% to 5% by weight of a sodium silicate having a ratio of Na_2O to SiO_2 of from 1 to 3.5, and

(f) from 1% to 50% by weight of other conventional ingredients for detergents of the type: soil suspension agents, optical brighteners, enzymes, antimicrobial agents, textile softeners, coloring compounds, perfumes, sodium sulfate and water.

4,179,392

BIODEGRADABLE HARD WATER DETERGENTS

El-Ahmadi I. Heiba, and Albert L. Williams, both of Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 100,543, Dec. 21, 1970, Pat. No. 3,770,643. This application Aug. 3, 1973, Ser. No. 385,623

Int. Cl.[2] C11D *9/26;* **C07C** *59/23*

U.S. Cl. 252—108 **3 Claims**

1. A detergent composition consisting essentially of a water soluble derivative of an alkanoic acid having a polyethylene glycol ether substituent attached to a carbon atom 2 to 5 positions from the carboxyl carbon, said polyethylene glycol containing 1 to 20 ethylene oxide residues, said derivative selected from the group consisting of alkali metal salts and ammonium salts of the said substituted alkanoic acid.

2. A detergent composition consisting essentially of the sodium or ammonium salt of 4-hydroxy tetradecanoic acid or 4-hydroxy eiconsanic acid.

4,179,393

STABLE AQUEOUS SUSPENSION OF WATER-INSOLUBLE, CALCIUM-BINDING ALUMINOSILICATES AND ORGANIC SUSPENDING AGENTS

Hans Andree; Dieter Jung, both of Hilden; Martin Bischoff, Gelsenkirchen; Jens Conrad, Hilden; Josef Huppertz, Dusseldorf-Holthausen; Günter Jakobi, Hilden; Peter Krings, Krefeld; Dieter Kühling, Monheim; Herbert Reuter, Hilden; Wolfgang Rupilius, Dusseldorf; Horst Rutzen, Langenfeld, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 2, 1977, Ser. No. 764,854

Claims priority, application Austria, Feb. 6, 1976, 841/76

Int. Cl.[2] C01B *33/28;* **C11D** *1/44, 1/48, 3/12*

U.S. Cl. 252—155 **19 Claims**

1. Stable, pumpable aqueous suspensions having a pH of between 7 and 12 of water-insoluble, calcium-binding aluminosilicates suitable as stock suspensions consisting essentially of:

(A) from 20% to 55% by weight on the anhydrous basis of at least one finely-divided, water-insoluble silicate compound having an average particle size in the range of from 0.01μ to 100μ and a calcium-binding power of from 50 to 200 mg CaO/gm of anhydrous substance when measured at 22° C. by the Calcium Binding Power Test Method described in the specification and having the formula, combined water not shown

$$(M_2O)_x.Me_2O_3.(SiO_2)_y$$

wherein M is a cation selected from the group consisting of sodium, potassium and lithium, x is a number from 0.7 to 1.5, Me is a member selected from the group consisting of aluminum and boron, and y is a number from 0.8 to 6,

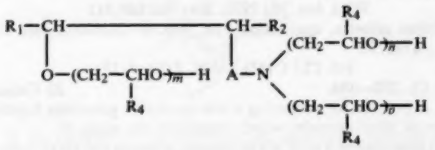
(B) from 0.2% to 5% by weight of at least one organic dispersing agent selected from the group consisting of:

(1) the adduct of an oxide selected from the group consisting of 1 to 3 mols of ethylene oxide, 1 to 3 mols of propylene oxide and 0.5 to 3 mols of glycide onto 1 mol of a diamine of the formula

$$R-NH-(CH_2)_k-NH_2$$

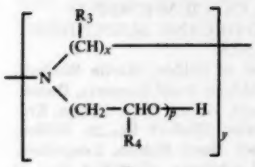
wherein R is a member having from 8 to 24 carbon atoms selected from the group consisting of alkyl and alkenyl and k is an integer from 2 to 6, and

(2) hydroxyalkyl amines of the formula

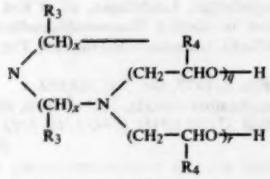


wherein R_1 is alkyl having 1 to 16 carbon atoms, R_2 is a member selected from the group consisting of hydrogen and alkyl having 1 to 16 carbon atoms, and the sum of the carbon atoms in R_1+R_2 is from 6 to 20 with the proviso that when R_2 is H, R_1 is alkyl having 6 to 16 carbon atoms, R_4 is a member selected from the group consisting of hydrogen and methyl, m, n and o represent integers from 0 to 3 and A is a bridging bond selected from the group consisting of:

(a)

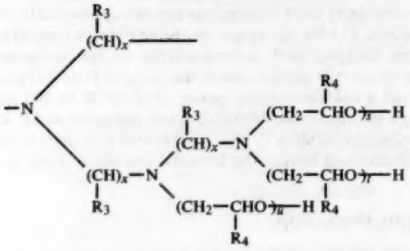


(b)



and

(c)



wherein R_3 is a member selected from the group consisting of hydrogen and methyl, x is an integer from 2 to 6, y is an integer from 1 to 3, p, q, r, s, t, and u represent integers from 0 to 3, with the proviso that the sum of m to u does not exceed 4, and

(C) water.

16. In the process for the preparation of a granular, tricklable washing and cleansing agent composition which comprises spraying an aqueous slurry of some of the ingredients onto a moving bed of the remaining ingredients in a dehydrated form, and recovering a granular tricklable washing and cleansing agent composition, the improvement consisting of employing the aqueous suspension of claim **1** in the preparation of said aqueous slurry.

4,179,394

PROCESS FOR IMPROVING THE STORAGE STABILITY OF ALKALI PERSALTS

Helmut Dillenburg, Rheinbrohl; Werner Doetsch, B. Hoenningen, and Rudolf Siegel, Neuwied, all of Fed. Rep. Of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Jan. 10, 1978, Ser. No. 868,311

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1977, 2700797

Int. Cl.[2] C11D *3/395, 7/54, 7/18*

U.S. Cl. 252—186 **22 Claims**

1. A process for preparing a storage-stable granulate formulation of alkali persalts which comprises the steps of

(a) granulating a solid alkali persalt, wherein the alkali cation is an alkali metal cation or ammonium and which is selected from the group consisting of solid addition-products of an alkali salt with hydrogen-peroxide and alkali salts of peroxo-acids in the presence of a sodium phosphate which is selected from the group consisting of sodium polyphosphates and sodium pyrophosphate and of water to obtain a granulate comprising granulate particles containing fully hydrated sodium phosphate adhered to solid alkali persalt particles, and

(b) drying the resulting granulate.

13. A storage stable granulate formulation of alkali persalts which comprises an alkali persalt wherein the alkali cation is an alkali metal cation or ammonium and which is selected from the group consisting of solid addition-products of an alkali salt with hydrogen peroxide and alkali salts of peroxo-acids and a fully hydrated sodium phosphate which is derived from a sodium phosphate selected from the group consisting of sodium polyphosphates and sodium pyrophosphate, which granulate formulation is obtained by the process as defined in claim **1**.

4,179,395

DICHROIC DYES HAVING A PLURALITY OF AZO BONDING GROUPS

Herbert S. Cole, Jr., Scotia, and Siegfried Aftergut, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 802,358, Jun. 2, 1977, Pat. No. 4,128,497, which is a continuation-in-part of Ser. No. 721,668, Sep. 9, 1976, abandoned. This application Sep. 22, 1978, Ser. No. 944,695

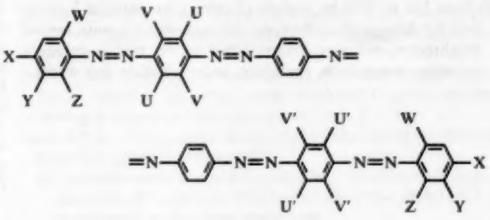
Int. Cl.[2] C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **7 Claims**

1. A dichroic liquid crystal composition for use in a liquid crystal display, comprising:

a host liquid crystal material of positive dielectric anisotropy; and

a guest dichroic dye dissolved in said liquid crystal material, said dichroic dye being a penta-azo dichroic dye having a general chemical formula

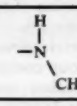


wherein the substituents at bonds U,U', V, V', W, X, Y, and Z are coordinately selected for a desired set of an approximate order parameter and an approximate wavelength of maximum absorption in accordance with the following table:

DYE	U	U'	V	V'	W
A	$-CH_3$	$-CH_3$	$-H$	$-H$	$-H$
B	$-CH_3$	$-CH_3$	$-H$	$-H$	$-OH$
C	$-CH_3$	$-CH_3$	$-H$	$-H$	$-H$
D	$-H$	$-CH_3$	$-CH_3$	$-H$	$-H$
E	$-H$	$-CH_3$	$-CH_3$	$-H$	$-H$

DYE	X	Y	Z	S (approx.)	max.(nm.) (approx.)
A	$(CH_3)_2N-$	$-H$	$-H$	0.73	525
B				0.70	545
C				0.65	590–620
D				0.80	595

-continued

E		—H	—H	0.80	595

the approximate order parameter and approximate wavelength of maximum absorption being measured with said dye dissolved in a host material consisting of a mixture of 70% by weight of p-pentylphenyl-2-chloro-4-(p-pentyl-benzoyloxy) benzoate, and 30% by weight of an ester mixture composed approximately 50–60% by weight of 4'-n-pentylphenyl ester of anisic acid, 25–35% by weight of 4'-n-pentylphenyl ester of 4-hexyloxybenzoic acid, and 10–15% by weight (2'-cyano-4'-butylphenyl) ester of 4-(hexanoyloxybenzoyloxy)-benzoic acid.

4,179,396

SINGLE ADDITION ORGANIC-INORGANIC BLEND EMULSION BREAKING COMPOSITION

Robert K. Gabel, Houston, Tex.; William H. Lindenberger, Darien, and Audrone M. Pavilcius, Chicago, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 23, 1978, Ser. No. 880,504

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—329 **18 Claims**

1. A single addition organic-inorganic blend emulsion breaking composition suitable for breaking oil-in-water emulsions, said blend consisting essentially of an aqueous solution having homogeneously dissolved therein a water soluble acidic inorganic aluminum salt and a water soluble quaternized dehydration condensation polymer of triethanolamine or acylated triethanolamine, or mixtures of triethanolamine or acylated triethanolamine, said polymer containing tertiary amino groups of which 20–100% are quaternized, said composition being acidic and having an acidity and a concentration such that said aluminum salt and said polymer remain dissolved in said solution for at least 14 days at temperatures of 40° F. to 110° F.

4,179,397

INDICATOR INK

Stanley E. Rohowetz, Barrington, and Eric Schoenfisch, Palatine, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed May 22, 1978, Ser. No. 907,903

Int. Cl.[2] C09D *11/10;* **C08L** *61/10;* **G01N** *21/06, 31/00, 31/22, 33/00;* **G01K** *11/16;* **C09K** *3/00*

U.S. Cl. 252—408 **22 Claims**

1. An ink composition suitable for use in contact or ink jet printing operations comprising a solution of (a) a soluble resole resin; (b) a combination of dyes of different color wherein one dye is water extractible and the other is relatively water non-extractible; said water extractible dye being present in proportion to said water-insoluble dye in a ratio of at least about 2:1; and (c) a solvent for said resin and dye combination consisting essentially of a lower aliphatic monohydric alcohol or mixture thereof, said composition undergoing a color change upon exposure to water at a temperature of at least about 120° F.

4,179,398

PLATELET CONTROL COMPOSITION

Roger A. Hunt, Woodland, Wash., assignor to ICN Medical Laboratories, Inc., Portland, Oreg.

Filed Mar. 21, 1977, Ser. No. 779,322

Int. Cl.[2] G01N *33/16;* **C09K** *3/00*

U.S. Cl. 252—408 **5 Claims**

1. A fluid suspension comprising red blood cells of a goat shrunken to substantially the size of human blood platelets, and fixed, the fluid being such that it does not cause hemolysis, cell association or biodegradation of the fixed cells.

4,179,399

METHOD OF REGENERATING ADSORBENTS

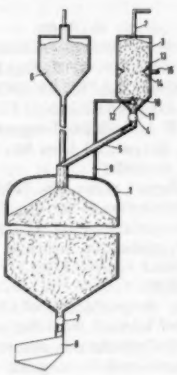
Horst Lichtenberger, Oberhausen; Karl Knoblauch, Essen; Horst Grochowski, Oberhausen; Harald Juntgen, and Jurgen Schwarte, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

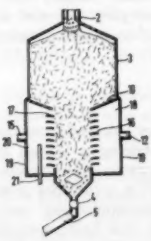
Filed Mar. 9, 1977, Ser. No. 775,982

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610074

Int. Cl.[2] B01J *21/20*

U.S. Cl. 252—411 S **6 Claims**





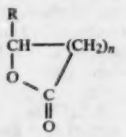
1. A method of regenerating an adsorbent charged with adsorbed substances, comprising the steps of confining a first and a second body of the adsorbent in separate first and second confining zones; mixing and contacting the first body of adsorbent in said first confining zone with a particulate heat carrier thereby heating the first body of the charged adsorbent to a temperature at which the charged adsorbent of the first body is desorbed and a desorption gas develops in the first confining zone; and passing the desorption gas from the first into the second confining zone and then through the second body of the charged adsorbent to capture at least one component of the desorption gas in the charged adsorbent of the second body.

4,179,400
PROCESS FOR PREPARING CATALYTIC SOLUTIONS OF SULFONIUM SALTS

Jung-Hsien Tsao, and Arthur D. Ketley, both of Columbia, Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 904,158, May 9, 1978, Pat. No. 4,154,872. This application Jan. 25, 1979, Ser. No. 6,322
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—429 R **5 Claims**

1. A process for preparing a photocatalytic solution of a sulfonium salt of a complex anion, capable of yielding a Lewis Acid when irradiated by UV light which comprises reacting a sulfonium halide with an alkali metal or ammonium salt of a complex anion in a solvent mixture containing a polyol containing at least two OH groups and a lactone of the formula:



wherein R is H or CH_3 and n is 2 to 4, the weight ratio of sulfonium halide:polyol:lactone is in the range 1:1 to 5:1 to 20, respectively.

4,179,401
PREPARATION OF HETEROGENEOUS CATALYSTS INCLUDING THE STEPS OF RADIATION GRAFTING OF AN ALPHA UNSATURATED MONOMER TO A METAL OR TO AN ORGANIC POLYMER

John L. Garnett, 29 Arabella St., Longueville, New South Wales, and Robert S. Kenyon, 29 Glen St., Eastwood, New South Wales, both of Australia

Continuation-in-part of Ser. No. 720,042, Aug. 30, 1976, abandoned, Continuation of Ser. No. 594,081, Jul. 8, 1971, abandoned. This application Jul. 11, 1977, Ser. No. 814,772
Claims priority, application Australia, Jul. 10, 1974, PB8162
Int. Cl.[2] B01J *31/28, 31/20, 31/24;* **G08F** *8/00*
U.S. Cl. 252—429 R **10 Claims**

1. A process for the production of a heterogeneous catalyst which is a member selected from the group consisting of hydrogenation-, hydroformylation-, isomerisation-, cracking- and dehydrogenation-catalysts for organic molecules comprising the steps of:

(a) irradiating a substrate selected from the group consisting of a metal and an organic polymer with ionizing radiation in the presence of an α olefin monomer having the formula:

$$X—R—C{=}CH_2$$

wherein R is a member selected from the group consisting of organic moieties containing a carbon chain of at least two carbon atoms and organic moieties containing an aromatic group, and wherein X is a member selected from the group consisting of nitrogen-containing and halogen-containing groups, the nitrogen- and halogen-containing groups being capable of being chemically converted to a group capable of coordinating with a member of the group consisting of metal salts and organometallic complexes so as to graft the monomer to the substrate to produce a monomer-substrate conjugate;

(b) chemically converting the X group of the monomer-substrate conjugate to a group which is capable of coordinating with a member selected from the group consisting of the metal salts and the organometallic complexes; and,

(c) reacting the X group of the monomer-substrate conjugate with a member selected from the group consisting of catalytic metal salts and catalytic organometallic complexes, which salts and complexes contain a metal selected from the group consisting of Ruthenium, Rhodium, Palladium, Osmium, Iridium and Platinum so as to transform the monomer-substrate conjugate into a ligand of the selected member of the group consisting of the catalytic metal salts and the catalytic organometallic complexes.

6. A process for the production of a heterogeneous catalyst which is a member selected from the group consisting of hydrogenation-, hydroformylation-, isomerisation-, cracking- and dehydrogenation-catalysts for organic molecules comprising the steps of:

(a) irradiating a substrate selected from the group consisting of a metal or an organic polymer with ionizing radiation in the presence of a monomer having the formula:

$$X—A$$

wherein A is a member selected from the group consisting of organic moieties containing an α olefin monomer group and organic moieties containing an α acetylene monomer group, and wherein X is a phosphorus-containing organic moiety capable of being chemically converted to a group capable of coordinating with a member selected from the group consisting of metal salts and organometallic complexes, so as to graft the monomer to the substrate to produce a monomer-substrate conjugate;

(b) chemically converting the X group of the monomer-substrate conjugate to a group which is capable of coordinating with a selected member of the group of the metal salts and organometallic complex and,

(c) reacting the X group of the monomer substrate conjugate with a member of the group consisting of catalytic metal salts and catalytic organometallic complexes which salts and complexes contain a metal selected from the group consisting of Ruthenium, Rhodium, Palladium, Osmium, Iridium and Platinum such that the monomer-substrate conjugate becomes a ligand of the selected member of the group consisting of the catalytic metal salts and catalytic organometallic complexes.

4,179,402
RESIN-METAL-LIGAND COMPOSITION

Leo Kim; Timm E. Paxson, and Sunny C. Tang, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1978, Ser. No. 905,813
Int. Cl.[2] B01J *31/08, 31/10*
U.S. Cl. 252—431 C **9 Claims**

1. A composition comprising:

(a) an ion exchange resin having a strongly acidic, weakly acidic, or mixed acid-base type functional group;

(b) an element, selected from the transition group of elements and which is directly bonded either coordinately or ionically to the ion exchange resin; and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element and further has at least one moiety selected from the group consisting of monohydrocarboyl ammonium, dihydrocarbyl ammonium, trihydrocarbyl ammonium, quaternary ammonium, pyridinium, phosphinium, arsenium and sulfonium ion which is ionically bonded to the ion exchange resin.

2. A composition comprising:

(a) an ion exchange resin having a basic-type functional group,

(b) an element selected from the transition group of elements and which is directly bonded either coordinately or ionically to the ion exchange resin; and

(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety containing a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element and further has at least one moiety

derived from the group consisting of carboxylic acid, phosphonic acid, phosphinic acid, sulfenic acid, sulfinic acid, sulfonic acid, boronic acid and boronous acid which is ionically bonded to the ion exchange resin.

4,179,403

RESIN-LIGAND-METAL COMPLEX COMPOSITIONS

Leo Kim; Timm E. Paxson, and Sunny C. Tang, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 19, 1977, Ser. No. 861,916
Int. Cl.[2] B01J 31/08; *31/10*
U.S. Cl. 252—431 C **9 Claims**

1. A composition comprising:
(a) an ion exchange resin having a strongly acidic, weakly acidic, or mixed acid-base type functional group;
(b) an element, selected from the transition group of elements; and
(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety selected from the group consisting of monohydrocarbyl ammonium, dihydrocarbyl ammonium, trihydrocarbyl ammonium, pyridinium and phosphonium which is ionically bonded to said ion exchange resin and further has at least one moiety which contains a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element.

2. A composition comprising:
(a) an ion exchange resin having a basic-type functional group;
(b) an element selected from the transition group of elements; and
(c) an organic linking compound of from 1 to about 100 carbon atoms which has at least one moiety derived from the group consisting of carboxylic acid, phosphonic acid, phosphinic acid, sulfenic acid, sulfinic acid, sulfonic acid, boronic acid and boronous acid which is ionically bonded to said ion exchange resin and further has at least one moiety which contains a heteroatom selected from the group consisting of trivalent nitrogen, trivalent phosphorus, trivalent arsenic, trivalent bismuth and trivalent antimony which is coordinately bonded to said element.

4,179,404

CATALYST PREPARATIVE METHOD

Bruno J. Barone, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Dec. 15, 1976, Ser. No. 750,920
Int. Cl.[2] B01J *27/14*
U.S. Cl. 252—435 **7 Claims**

1. In the process for the preparation of vanadium-phosphorus containing oxidation catalysts comprising the reduction of pentavalent vanadium to a valence of less than +5 with a trivalent phosphorus compound, reducing agent, wherein the improvement comprises employing from about 75 to 90% of the stoichiometric amount of reducing agent necessary to reduce the valency of the vanadium from +5 to +4.

4,179,405

ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 810,321, Jun. 27, 1977, Pat. No. 4,110,200, which is a continuation-in-part of Ser. No. 713,020, Aug. 9, 1976, Pat. No. 4,036,742, which is a continuation-in-part of Ser. No. 656,925, Feb. 10, 1976, Pat. No. 4,025,418, which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,056. This application May 17, 1978, Ser. No. 906,728
Int. Cl.[2] B01J *27/08, 27/10*
U.S. Cl. 252—441 **15 Claims**

1. An acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.01 to about 5 wt. % indium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and indium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the indium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,179,406

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 744,061, Nov. 22, 1976, Pat. No. 4,115,252. This application Mar. 31, 1978, Ser. No. 892,369
Int. Cl.[2] B01J *27/08, 27/10*
U.S. Cl. 252—442 **14 Claims**

1. In an acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, and about 0.1 to about 3.5 wt. % halogen; wherein said platinum group metal and catalytically available cobalt are uniformly dispersed throughout said halogenated porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of said catalytically available cobalt is present in the elemental state or in a state which is reducible to said elemental metallic state or in a mixture of these states under hydrocarbon conversion conditions, THE IMPROVEMENT WHICH COMPRISES the uniform dispersal of from about 0.01 to about 5 wt. % zinc throughout said halogenated porous material.

4,179,407

CATALYST BED FOR USE IN DECOMPOSITION OF AMMONIA GAS

Kiyotaka Iiyama; Takeshi Matsui, both of Yokohama; Shigeru Kusakata, Kawasaki; Hideo Watanabe, Yokohama, and Michihisa Takahashi, Tachikawa, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 768,026, Feb. 14, 1977, abandoned. This application May 25, 1978, Ser. No. 909,696
Claims priority, application Japan, Feb. 20, 1976, 51-17037
Int. Cl.[2] B01J *21/18, 29/06*
U.S. Cl. 252—446 **5 Claims**

1. A catalyst bed for use in oxidizing ammonia gas, said catalyst bed consisting essentially of a mixture of (1) one part by weight of granules carrying catalyst effective for catalyzing oxidation of ammonia gas by air, at an elevated temperature higher than 180° C., to oxidize said ammonia gas into nitrogen gas and water vapor, said granules carrying catalyst consisting essentially of particles in which at least one catalyst material selected from the group consisting of platinum, rhodium, ruthenium and alloys thereof is carried on round spherical bases made of a carrier material selected from the group consisting of alumina, silica, zeolite, kaolin and silicon carbide, said bases having a diameter of from 2 mm to 10 mm and carrying from 0.05% to 1.0% by weight of said catalyst material, and (2) from 0.2 to 10 parts by weight of granules consisting of catalytically inert substance which inert substance does not catalyze reaction of the ammonia gas and is effective to maintain the maximum temperature of ammonia gas flowing through the catalyst bed at a level such that generation of nitrogen oxides is minimized, said granules of catalytically inert substance consisting of at least one substance selected from the group consisting of alumina, silica, zeolite, kaolin, silicon carbide, catalytically

inert metals and metal oxides, said granules of catalytically inert substance having a diameter of from 2 mm to 10 mm.

4,179,408

PROCESS FOR PREPARING SPHEROIDAL ALUMINA PARTICLES

Moises G. Sanchez, Severna Park; Michael V. Ernest, Baltimore, and Norman R. Laine, Rockville, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,379

Int. Cl.[2] B01J *21/04, 37/00*

U.S. Cl. 252—448 **27 Claims**

1. A process for preparing spheroidal alumina particles comprising:

(a) commingling a precipitated alumina and an acidic aqueous medium to provide a slurry;

(b) forming droplets of the slurry;

(c) passing the droplets downwardly through air into an upper body of water-immiscible liquid and ammonia and into a lower body comprising aqueous ammonia to form spheroidal particles;

(d) aging the particles in aqueous ammonia; and

(e) drying and calcining the aged particles.

4,179,409

HYDROCARBON CRACKING CATALYST

Elroy M. Gladrow, and Kenneth S. Wheelock, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 9, 1977, Ser. No. 850,038

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **19 Claims**

1. A catalyst comprising (1) a crystalline aluminosilicate zeolite, (2) an inorganic oxide gel, and (3) an effective amount of a perovskite having at least one transition metal cation.

17. A catalyst comprising (1) from about 5 to about 16 weight percent of a crystalline aluminosilicate zeolite, (2) from about 60 to about 90 weight percent of an inorganic oxide gel, and (3) from about 1.5 to about 4 weight percent of a perovskite having a transition metal cation selected from the group consisting of lanthanum, cobalt, cerium, hafnium, chromium, zirconium and mixtures thereof, each of said weights being based on the total catalyst.

4,179,410

COBALT-MOLYBDENUM-ALUMINA DESULFURIZATION CATALYST

Howard D. Simpson, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 751,383, Dec. 17, 1976, Pat. No. 4,097,413. This application Jan. 3, 1978, Ser. No. 866,282

Int. Cl.[2] B01J *21/04, 23/88*

U.S. Cl. 252—465 **3 Claims**

1. An intimately composited hydrodesulfurization catalyst composition comprising a molybdenum component corresponding to about 22–28wt.% of MoO_3 and a cobalt component corresponding to about 6–10 wt.% of CoO dispersed and supported on an alumina base, said catalyst being free of X-ray detectable crystallites of $CoMoO_4$, and having a surface area of at least about $M/0.14$ m^2/g, where M is the molybdenum content of the catalyst expressed as wt.% MoO_3.

4,179,411

METHOD OF PREPARING A CONTROLLED PORE VOLUME ALUMINA WITH CITRIC ACID

Frank R. Broersma, Anaheim, Calif., and Monica E. Choca, Chicago, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 825,995, Aug. 19, 1977, abandoned, which is a continuation-in-part of Ser. No. 630,485, Nov. 10, 1978, abandoned. This application Nov. 10, 1977, Ser. No. 850,123

Int. Cl.[2] B01J *21/04, 23/28, 23/30, 23/74*

U.S. Cl. 252—465 **4 Claims**

1. A method for preparing an alumina useful as a catalyst support having a controlled pore volume distribution, said method consisting essentially of:

A. Preparing an aqueous solution of a soluble aluminum salt containing a quantity to be defined in step B of a water-soluble polycarboxylic acid containing 2–12 carbon atoms;

B. Precipitating an aluminum/hydroxide gel from the solution of the soluble aluminum salt, the quantity of polycarboxylic acid present in step A being from 0.1–15% by weight of the total dry weight of alumina present in said aluminum hydroxide gel;

C. Purifying said aluminum hydroxide gel;

D. Forming said aluminum hydroxide gel;

E. Drying said aluminum hydroxide gel;

F. Calcining said aluminum hydroxide gel; and then,

G. Recovering an alumina useful as a catalyst support having a controlled pore volume distribution;

said pore volume distribution being characterized in that:

A. Nitrogen desorption measurements indicate that less than 10% of the total pores as determined by said method fall between 100–1200 Å in diameter;

B. Nitrogen adsorption measurements indicate that between 10–50% of the total pore volume as determined fall between 100–1200 Å in diameter; and,

C. Mercury penetration porisimetry indicates that less than 10% of the total pores as determined by both nitrogen desorption and mercury methods fall between 100–50,000 Å in diameter.

4,179,412

PROCESS FOR PRODUCING CATALYST PRECURSORS FOR DECOMPOSING AMMONIA BY OXIDATION AND PRECURSORS PRODUCED BY SAID PROCESS

Hideya Inaba; Yasumi Kamino; Shigenori Onizuka, and Chikashi Inazumi, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jan. 30, 1978, Ser. No. 873,693

Claims priority, application Japan, Mar. 14, 1977, 52/28297; Sep. 20, 1977, 51/113079

The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.

Int. Cl.[2] B01J *23/22, 23/42, 25/00*

U.S. Cl. 252—472 **15 Claims**

1. A process for producing a catalyst precursor for decomposing NH_3 by oxidation consisting essentially of the steps of converting the surface layer of steel material of specified shape resembling a ring, honeycomb or plate to an aluminum alloy, treating the steel material with an aluminum dissolving solution to dissolve out the aluminum and to render the surface layer porous, subjecting the resulting steel material to oxidation treatment to obtain a catalyst carrier, immersing the carrier in a solution of a platinum compound selected from the group consisting of chroloplatinic acid and platinum sulfate, and drying it.

4,179,413

ENRICHED RHODIUM CATALYST AND METHOD FOR MAKING SAME

Haren S. Gandhi, Farmington Hills; Mordecai Shelef, Birmingham, and Paul P. Wynblatt, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 775,809, Mar. 9, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,573

Int. Cl.[2] B01J *23/42, 23/46*

U.S. Cl. 252—472 18 Claims

1. A method for enriching the amount of rhodium which is actively available for use as a catalyst in a catalyst system which includes a substrate and at least platinum and rhodium as catalyst elements, said platinum and rhodium being in a ratio of about 8:1 to 19:1, which method comprises:

thermally treating the catalyst system by heating it in an oxidizing atmosphere to a temperature in the range from 650° C. to 875° C. for a period of at least two hours.

4,179,414

FATTY ACID DIETHANOL AMIDE-CONTAINING GENERAL PURPOSE CLEANER IN PASTE FORM

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,823

Int. Cl.[2] C11D *3/10, 3/32, 17/00*

U.S. Cl. 252—548 6 Claims

1. A stable paste comprising between about 50 and about 65 weight percent sodium bicarbonate and between about 50 and about 35 weight percent water, containing between about 5 and about 20 weight percent sodium chloride based on water and between about 10 and about 30 weight percent based on water of a diethanolamide of a fatty acid having about 12–16 carbon atoms.

4,179,415

PRESSURE SENSITIVE ADHESIVE AND PROCESS

Cyrus W. Bemmels, North Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 8, 1977, Ser. No. 822,455

Int. Cl.[2] C09J *3/12, 3/14*

U.S. Cl. 260—4 R 17 Claims

1. A water-based pressure-sensitive adhesive composition which comprises: a mixture of a latex component comprising polymeric elastomer solids in a water system, and a high solids tackifier resin solution comprising about 50–90 percent tackifier resin solids for pressure-sensitive adhesive dissolved in organic solvent, said resin solution being dispersed in the latex component; said latex component comprising about 50–100 percent isoprene polymer portions by weight of said elastomer solids and said resin solids being present in the amount of about 50–200 parts per 100 parts by weight of said elastomer solids; said composition comprising a small amount of carboxylation in the form of carboxyl groups on the elastomer solids, and having a pH of at least about 8.

4,179,416

ALLOY RAYON FIBERS HAVING DISPERSED THEREIN AN AMIDE POLYMER AND A POLYACRYLIC ACID SALT

Frederick R. Smith, Toms Brook, Va., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 309,076, Nov. 24, 1972, Pat. No. 3,919,385, and Ser. No. 530,476, Dec. 6, 1974, Pat. No. 3,951,889, and Ser. No. 625,445, Oct. 24, 1975, Pat. No. 4,041,121, and Ser. No. 629,952, Nov. 7, 1975, abandoned, and Ser. No. 741,172, Nov. 12, 1976, abandoned, said Ser. No. 530,476, is a division of Ser. No. 309,076, , said Ser. No. 625,445, is a continuation-in-part of Ser. No. 309,290, Nov. 24, 1972, abandoned. This application Feb. 23, 1978, Ser. No. 880,535

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.[2] C08L *1/02*

U.S. Cl. 260—17.4 CL 4 Claims

1. Alloy rayon fibers of higher fluid-holding capacity than non-alloy rayon, comprising a regenerated cellulose matrix having dispersed therein a polyvinylpyrrolidone polymer and an alkali metal salt of a polyacrylic acid.

4,179,417

COMPOSITION FOR WATER-BASE PAINT COMPRISING WATER-SOLUBLE RESIN AND WATER-DISPERSIBLE POLYMER

Masuyuki Sunada, Chiba; Hirotugu Takanashi, Tateyama; Hidenobu Ishikawa, Chiba; Akikazu Takahashi, Matsudo, and Fumio Yoshino, Ichihara, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,076

Claims priority, application Japan, Dec. 17, 1976, 51/150759

Int. Cl.[2] C09D *3/52, 3/58, 3/76, 5/02*

U.S. Cl. 260—18 EP 18 Claims

1. A composition for water-base paints, said composition comprising (I) a water-soluble resin, and (II) a water-dispersible polymer containing at least one member selected from the group consisting of hydroxyl and carboxyl groups, said water-soluble resin (I) being obtained by polymerizing (1) 50 to 99.5% by weight of an alkyl ester of an α,β-monoethylenically unsaturated acid or an alkenyl benzene, (2) 0.5 to 20% by weight of an α,β-monoethylenically unsaturated acid and (3) 0 to 30% by weight of a hydroxyalkyl ester of an α,β-monoethylenically unsaturated acid in the presence of (4) at least one unsaturated compound selected from the group consisting of alkyd resins containing a polymerizable unsaturated group, epoxy esters containing a polymerizable unsaturated group, drying oils, fatty acids of drying oils and diene polymers, and water-solubilizing the product with ammonia or an amine, said water-dispersible polymer (II) being obtained by emulsion polymerization of at least one member selected from the group consisting of an α,β-monoethylenically unsaturated acid and a hydroxyalkyl ester of an α,β-monoethylenically unsaturated acid with an ethylenically unsaturated monomer, the amount of the water-dispersible polymer (II) being 10 to 900 parts by weight per 100 parts by weight of the water-soluble resin (I).

4,179,418

WATER-BASED EPOXY RESIN COATING COMPOSITION

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Continuation-in-part of Ser. No. 865,050, Dec. 27, 1977. This application Mar. 6, 1978, Ser. No. 884,077

The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclaimed.

Int. Cl.[2] C08L *63/02*

U.S. Cl. 260—18 PN 8 Claims

1. An epoxy resin composition being the cured product of a curable admixture which comprises:

an epoxy resin comprising a condensation product of epichlorohydrin with 2,2-bis(p-hydroxyphenyl) propane ,

a curing amount of a reactive water compatible polyamide prepared from multifunctional carboxylic acids, esters, anhydrides or mixtures and an aminopropyl derivative of a polyoxyalkylenepolyamine and

an aqueous medium.

4,179,419
Patent Not Issued For This Number

4,179,420
WATER SOLUBLE INSULATING VARNISH

Deno Laganis, Schenectady, N.Y., assignor to Schenectady Chemicals, Inc., Schenectady, N.Y.

Continuation-in-part of Ser. No. 624,569, Oct. 21, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,107
Int. Cl.[2] C09D *3/52, 3/64, 3/66, 5/02*
U.S. Cl. 260—21 **27 Claims**

1. A process for forming a water-dispersible polyester capable of being solubilized to become water-soluble comprising reacting (1) with (2a) to form (I), wherein

(1) is isophthalic acid, terephthalic acid, benzophenone dicarboxylic acid or mixtures thereof and wherein

(2a) includes a polyol having at least three hydroxyl groups and a diol, wherein said polyol is trimethylol-propane, tris(hydroxymethyl)aminoethane, trimethylolethane, glycerine, pentaerythritol or tris(hydroxyethyl)isocyanurate and said diol is neopentyl glycol, 1,4-butylene glycol, dimethyl hydantoin, dipropylene glycol, ethylene glycol, diethylene glycol, propylene glycol, cyclohexane dimethanol, hydrogenated bisphenol A, hydroquinone di-(beta-hydroxyethyl) ether, the diether of propylene glycol and bisphenol A, or the diether of ethylene glycol and bisphenol A; wherein said triol is present in amounts up to 35 mole percent of all reactants used to form said polyester;

wherein said polyol and said diol are heated together and then said component (1) is added thereto;

and adding (II) which is (a) trimellitic anhydride; (b) an aliphatic dibasic acid which is adipic acid, succinic acid, azelaic acid, sebacic acid, dimerized fatty acids, maleic acid, fumaric acid or an anhydride of said acids or (c) a cycloaliphatic acid which is tetrahydrophthalic acid, hexahydrophthalic acid, 3,6-endomethylene, delta[4]-tetrahydrophthalic acid or an anhydride of said acid, which component (II) is 15 to 65 mole percent based on the total moles of (1) and (II), and wherein (1) comprises 35 to 85 mole percent of the total amount of (1) and (II);

wherein the mixture of (1) and (2a) is heated until a portion of the mixture containing 100 percent solids is characterized by an acid number of at least about 10.

4,179,421
SILICA FILLED VULCANIZATES

Douglas C. Edwards, and Kyosaku Sato, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Mar. 6, 1978, Ser. No. 883,742
Claims priority, application Canada, Apr. 14, 1977, 276158
Int. Cl.[2] C08K *3/36, 5/09, 5/17;* **C08L** *15/00*
U.S. Cl. 260—23.7 M **8 Claims**

4. An improved silica filled rubbery vulcanizate obtained by the vulcanization of a mixture comprising 100 parts by weight of a vulcanizable hydrocarbyl polymer containing from about 4 to about 60 millimoles of epoxy groups per 100 grams of polymer, and from about 5 to about 100 parts by weight of silica, said mixture having been subjected to shearing at a temperature of from about 100° to about 175° C. prior to incorporation of vulcanization active compounds and vulcanization, said shearing being for a time of from about 0.25 to about 10 minutes, said vulcanizable hydrocarbyl polymer being selected from C_4–C_6 conjugated diolefin polymers containing epoxy groups and from epoxy group containing polymers of a C_4–C_6 conjugated diolefin and at least one other copolymerizable vinyl or vinylidene-containing monomer, and said silica having an average particle size of about 0.01 to about 0.1 microns.

4,179,422
ELASTOMERIC BLEND COMPOSITIONS OF A SULFONATED ELASTOMER POLYMER AND A CRYSTALLINE POLYOLEFINIC THERMOPLASTIC RESIN

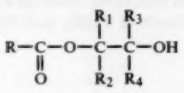
Henry S. Makowski, Scotch Plains, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,772
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 B **31 Claims**

1. A blend composition comprising:

(a) a neutralized sulfonated elastomeric polymer having about 15 to about 50 meq of metal sulfonate groups per 100 grams of said polymer said metal sulfonate groups being neutralized with a metal counterion;

(b) a hydroxyalkyl carboxylate having the formula:



wherein R, R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, C_1 to C_{18} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, or arylalkyl groups and functional derivatives thereof and mixtures thereof; and

(c) about 120 to about 900 parts by weight of a thermoplastic resin per 100 parts of said neutralized sulfonated elastomeric polymer and said hydroxyalkyl carboxylate ester.

4,179,423
WATER-SOLUBLE POLYESTER IMIDE RESINS

Deno Laganis, Schenectady, and Paul M. Begley, Scotia, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Continuation of Ser. No. 694,432, Jun. 9, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,798
Int. Cl.[2] C08L *67/02, 77/12;* **C08G** *73/16*
U.S. Cl. 260—29.2 N **24 Claims**

1. A water soluble thermosetting second polyester - imide prepolymer composition prepared by reacting reactants con-

sisting essentially of a tertiary amine and a first polyester - imide prepolymr having a number average molecular weight of 600–1300, an OH:COOH ratio of from 1.8:1 to 2.5:1 and an imide content of 5 to 60% based on the total imide and ester moieties, the alcohol of the ester moiety consisting essentially of 10 to 90% of the total equivalents of dihydric alcohol and the balance of the alcohol containing at least three hydroxyl groups, the acid component of the ester moiety consisting essentially of dicarboxylic acid, the imide moiety consisting essentially of the reaction product of approximately two moles of an aromatic monocarboxylic acid monoanhydride with one mole of an aromatic diamine.

4. A composition according to claim 1, dissolved in water said composition being suitable for use as a wire enamel.

4,179,424
METHOD FOR RAPIDLY PRODUCING AMINO METHYLATED POLYMERS AND QUATERNARY AMMONIUM SALTS THEREOF

Kenneth G. Phillips, River Forest; Edward G. Ballweber, Glenwood, and John R. Hurlock, Hickory Hills, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 21, 1977, Ser. No. 853,772
Int. Cl.[2] C08L *61/20*
U.S. Cl. 260—29.4 UA **5 Claims**

1. An improved process for rapidly preparing amino methylated derivatives of dilute aqueous solutions of acrylamide polymers which comprises the steps:

A. Preparing a 2.8–6% aqueous solution of an acrylamide polymer which has a molecular weight of at least 500,000;

B. Adding to the solution formed in A approximately 1 mole of formaldehyde and approximately 1 mole of a dialkyl amine which contains from 2–4 carbon atoms based on the amide content of the acrylamide polymer under conditions of good agitation;

C. Reacting the acrylamide polymer with the formaldehyde and the dialkyl amine at a temperature between 80°–100° C. for a period of time ranging between 2–15 minutes to form an amino methylated acrylamide polymer.

4,179,425
SELF-CROSSLINKING CATIONIC POLYURETHANE BASED ELECTRODEPOSITABLE BINDERS

Georgios Pampouchidis, and Helmut Hönig, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed Feb. 2, 1978, Ser. No. 874,563
Claims priority, application Austria, Feb. 7, 1977, 757/77
Int. Cl.[2] C08L *33/08*
U.S. Cl. 260—29.6 NR **12 Claims**

1. Thermosetting binders which are water-dilutable and suitable for cathodically depositable coatings comprising the reaction product of (A) 1 mole polyisocyanate, (B) at least 1 mole dialkylalkanolamine and (C) at least one member of the group consisting of monohydroxyalkyl(meth)acrylate, monohydroxyalkoxy(meth)acrylate, and monohydroxyallylether of a polyol, said reaction product having an NCO-value of substantially zero, a molecular weight of from about 500 to about 5000, a basic content of about 0.5 to 3 for each 1000 molecular weight unit of binder, and a double bond content of from about 0.5 to 4.

4,179,426
STABLE ALKYLHYDRIDOPOLYSILOXANE EMULSIONS

Hans-Horst Steinbach, Bergisch-Gladbach; Karl Schnurrbusch, Leverkusen; Matthias Rieder, Cologne, and Otto Weiden, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 4, 1978, Ser. No. 866,965
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701724
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—29.2 M **5 Claims**

1. In an aqueous alkylhydridopolysiloxane emulsion, the improvement which comprises about 0.1–5% by weight of the total amount of emulsion of an emulsifier containing perfluoroalkyl groups and selected from the group consisting of an ether of the formula

$$C_xF_{2x+1}SO_2N(CH_3)CO—(OCH_2—CH_2.)_n—(OCHCH_3CH_2)_m—OC_4H_9$$

and an alkanesulphonic acid salt of the formula

$$C_xF_{2x+1}SO_3N(C_pH_{2p+1})_4$$

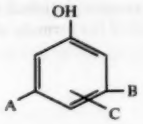
wherein
x=6–12,
m=2–40,
n=2–40, and
p=1–3,
thereby stabilizing the emulsion against loss of hydrogen.

4,179,427
PHENOLIC RESIN-POLYISOCYANATE BINDERS

John J. Gardikes, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 21, 1978, Ser. No. 888,715
Int. Cl.[2] C08L *61/14, 75/08*
U.S. Cl. 260—29.2 TN **20 Claims**

1. A binder composition comprising in admixture a resin component, a hardener component and a curing agent, wherein the resin component comprises an aqueous emulsion of a phenolic resin which comprises the condensation product of a phenol having the general formula:



wherein A, B and C are hydrogen, hydrocarbon radicals, oxyhydrocarbon radicals or halogen, with an aldehyde having the general formula R'CHO wherein R' is hydrogen or a hydrocarbon radical of 1 to 8 carbon atoms; the hardener component comprising a liquid polyisocyanate containing at least two isocyanate groups; and the curing agent comprising a tertiary amine or a metal ion.

4,179,428
PROCESS FOR PRODUCING WATER-EMULSIFIABLE PAINT BINDERS FOR STOVING PAINTS

Bertram Zückert; Wolfgang Schmut, and Klaus Behmel, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria

Filed May 19, 1977, Ser. No. 798,492
Claims priority, application Austria, May 21, 1976, 3748/76
Int. Cl.[2] C08L *61/28, 67/08;* C09D *3/66*
U.S. Cl. 260—29.4 R **4 Claims**

1. A water-emulsifiable paint binder which includes the water emulsion of the co-condensation product of from

(1) 5–30% by weight of a reaction product (A),

(2) 50–85% by weight, in relation to said reaction product (A), of an alkyd resin with an acid number of below 5 mg KOH/g and an intrinsic viscosity of from about 4 to 8 ml/g in chloroform at 20° C., and

(3) 10–25% by weight, in relation to said reaction product (A), of an alkyd resin with an acid value of between from about 80 and 140 mg KOH/g and an intrinsic viscosity of from about 4 to 10 ml/g in dimethylformamide at 20° C.,

said co-condensation product having been produced by carrying out the reaction of (1), (2), and (3) at a temperature of from about 50° to 150° C. to an intrinsic viscosity of between from about 6 and 12 ml/g in chloroform at 20° C. without surpassing the emulsifiable state; said reaction product (A) being the reaction product obtained by reacting at a temperature of from about 70° to 200° C. from about

(1) 30–75% by weight of an aminoaldehyde resin at least partly etherified with monoalcohols with from about 1 to 4 C-atoms, and

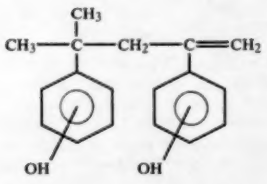
(2) 25–70% by weight, in relation to said aminoaldehyde resin, of polyethylene glycols with an average molecular weight of from about 500 to 3000 and having an intrinsic viscosity of from about 5 to 15 ml/g in chloroform at 20° C.

4,179,429
LAMINATES PREPARED FROM RESOL-TYPE PHENOL RESINS

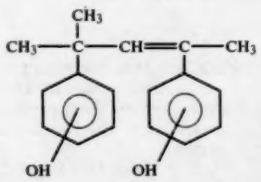
Kunio Hanauye; Tsutomu Takase, and Yoshio Morimoto, all of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 732,917, Oct. 15, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 871,072
Claims priority, application Japan, Oct. 22, 1975, 50-126281
Int. Cl.[2] C08G *8/20, 8/24;* B32B *27/42*
U.S. Cl. 260—32.8 R **4 Claims**

1. A laminate prepared from the product of a basic-catalyst-catalyzed reaction of, based on the total weight of the phenol components of said a resol-type phenol resin, 2–60% of a dimer of isopropenyl phenol of the formula selected from:



and



and 40–98% of other phenolic compounds selected from the group consisting of phenol, alkyl phenols having from 1 to 20 carbon atoms in the alkyl group, bisphenol-A, phenylphenols, cumyl phenol, styrenated phenols, catechol and resorcinol with formaldehyde.

4,179,430
Patent Not Issued For This Number

4,179,431
PRECIPITATED SILICIC ACID GRANULES

Eberhard Kilian, Hanau; Alfons Kreher, Frankfurt; Peter Nauroth, Wesseling, and Günter Türk, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Rosseler, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,845
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1978, 2803917
Int. Cl.[2] C08K *9/08*
U.S. Cl. 260—42.37 **20 Claims**

1. Precipitated silicic acid granules having the following physical-chemical properties:

tamped weight (DIN 53 194): 200–320 g/l

l/d ratio: $0.8 \leqq l/d \leqq 3.5$

hardness of individual granule: 80–175 pond

dust content (DIN 53 583): 0.2–0.4% by weight

abrasion (DIN 53 583): 0.2–0.3% by weight.

4,179,432
STABILIZED POLYPROPYLENE COMPOSITIONS

Kenneth R. Molt, Montgomery, Ohio, assignor to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Filed Sep. 2, 1975, Ser. No. 609,816
Int. Cl.[2] C08K *5/58*
U.S. Cl. 260—45.75 S **40 Claims**

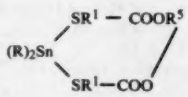
1. A composition comprising polypropylene stabilized against ultraviolet light by a stabilizingly effective amount of a synergistic mixture of (1) a 2-hydroxybenzophenone and (2) an organotin compound of the formula:

(a) $RnSn(SR^1COOR^2)_{4-n}$,

(b) $RnSn(SR^2)_{4-n}$,

(c) $RnSn(SR^1OOCR^2)_{4-n}$,

(d) $((R)_3Sn-S)_x R_4(Z)_y$, or



(e)

where R is alkyl, aryl, alkenyl, alkaryl, alkaryl or cycloalkyl, R^1 is alkylene, arylene, cycloalkylene, aralkylene or alkarylene, R^2 is an alkyl, aryl, aralkyl, alkenyl, al-aryl or cycloalkyl, R^5 is alkylene, R^4 is aliphatic, aromatic, araliphatic, alkyl substituted aromatic or cycloaliphatic radical and having a free valence of x+y, Z is —OH, —COOH, —$COOR^2$ or —$OOCR^2$, x is 1 to 4, y is 0 to 3, x+y is 1 to 4 and n is 1 to 3, with the proviso that when x is 1 and y is 1 and R^4 is alkylene, arylene, cycloalkylene, aralkylene or alkarylene Z is not $COOR^2$ or —$OOCR^2$ and when x is 1 y is not 0.

4,179,433

ANGIOTENSIN II ANTAGONIST PEPTIDES CONTAINING AN ALPHA-AMINOOXYACID IN THE POSITION-1

Lajos Kisfaludy; Olga Nyéki née Kuprina; Maria Skirmai née Sárközi; Egon Kárpáti; Katalin Gidai, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 11, 1978, Ser. No. 923,681

Claims priority, application Hungary, Jul. 18, 1977, RI 640

Int. Cl.[2] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R 5 Claims

1. A peptide of the formula:

X-Arg-Val-Tyr-Ile-His-Pro-Y

wherein

X is aminooxyacetyl or alpha-aminooxypropionyl and Y is leucyl, isoleucyl, alanyl or threonyl or an acid addition salt or complex thereof.

4,179,434

AMINO ACID DERIVATIVES

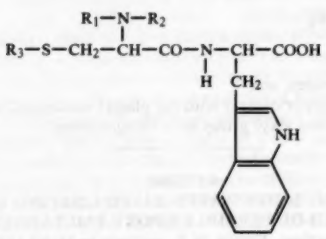
Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 759,685, Jan. 17, 1977, Pat. No. 4,113,715. This application Jun. 29, 1978, Ser. No. 920,602

Int. Cl.[2] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 R 4 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkanoyl, or amino (imino)methyl;

R_2 is hydrogen, lower alkyl or phenyl-lower alkylene; and

R_3 is hydrogen, lower alkanoyl, or benzoyl.

4,179,435

AZO DYESTUFFS HAVING A CARBOXYL GROUP AND A SUBSTITUTED SULFONYLIMINO GROUP IN THE COUPLING COMPONENT

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

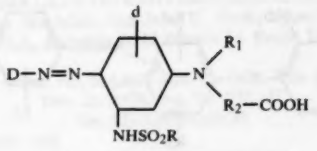
Division of Ser. No. 723,120, Sep. 14, 1976, Pat. No. 4,115,381, which is a continuation of Ser. No. 485,054, Jul. 1, 1974, abandoned, which is a continuation of Ser. No. 243,469, Apr. 12, 1972, abandoned. This application Jun. 22, 1978, Ser. No. 918,209

Claims priority, application Switzerland, May 3, 1971, 6468/71

Int. Cl.[2] C09B *29/08, 29/26, 29/36;* D06P *3/52*

U.S. Cl. 260—158 6 Claims

1. A dyestuff of the formula



in which

D is a diazo component radical selected from the group consisting of thiazolyl which is unsubstituted or substituted by chloro, bromo, nitro, cyano, thiocyano, lower alkyl, lower aralkyl, phenyl, lower cyanoalkyl, lower alkoxy, lower alkoxycarbonyl, trifluoromethyl, lower alkylcarbonyl or lower alkylsulfonyl; benzthiazole which is unsubstituted or substituted by chloro, bromo, cyano, thiocyano, lower alkyl, lower alkoxy, lower aralkoxy, phenyl, lower alkylmercapto, lower alkylsulfonyl, trifluoromethyl, nitro, cyanoethylsulfonyl, aminosulfonyl, monoalkylated aminosulfonyl, dialkylated aminosulfonyl, or lower alkoxycarbonyl; pyrazole which is unsubstituted or substituted by cyano, lower alkyl, lower alkoxy, lower alkoxycarbonyl or phenyl; thiadiazolyl which is unsubstituted or substituted by chloro, bromo, lower alkoxy, alkylmercapto, lower alkyl, lower alkylsulfonyl, phenyl, methylthiophenyl, nitrophenyl, tolyl, chlorophenyl or bromophenyl; imidazolyl which is unsubstituted or substituted by nitro or lower alkyl; thienyl which is unsubstituted or substituted by nitro, lower alkoxycarbonyl, lower alkyl, lower alkylsulfonyl, acetyl, aminosulfonyl or alkylated aminosulfonyl; isothiazolyl which is unsubstituted or substituted by alkyl, phenyl or cyano; benzisothiazolyl which is unsubstituted or substituted by lower alkyl, nitro, bromo or chloro; and pyridyl which is substituted by lower alkyl, cyano, bromo or chloro;

d is hydrogen, chloro, lower alkyl, lower alkoxy, lower alkylmercapto, aryl, aryloxy or arylmercapto;

R_1 is C_1–C_5 alkyl which is unsubstituted or substituted by chloro, bromo, hydroxy, phenoxy, phenyl, cyano, C_1–C_4-alkoxy, formylamino, C_1–C_4-alkylcarboxyloxy, C_1–C_4-alkylcarbamoyloxy, phenylcarbamoyloxy, C_1–C_3-alkoxycarbamoyloxy, benzoyloxy, phenoxycarbonyloxy or benzoyloxy;

R_2 is straight or branched chain alkylene of 1 to 4 carbon atoms; and

R is C_1–C_5 alkyl or a group of the formula

where R_3 and R_4 are C_1–C_5 alkyl, or R_3 and R_4 together with the nitrogen to which they are attached, represent morpholino or piperidino.

4,179,436

MONOAZODYESTUFFS CONTAINING DIPHENAMINE AND PHENOXY COMPONENTS

Herbert Hugl; Karl H. Schündehutte, both of Leverkusen; Kersten Trautner, Cologne, and Gerhard Wolfrum, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

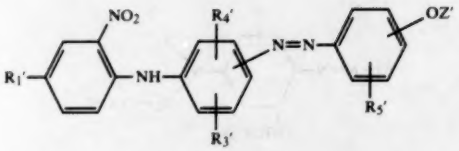
Filed Jul. 6, 1977, Ser. No. 813,312

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630989

Int. Cl.[2] C09B *29/12, 43/00;* D06P *1/18, 3/54*

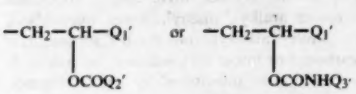
U.S. Cl. 260—206 11 Claims

1. Azo dyestuff having the formula



wherein

Z′ is C_1–C_4-alkyl; C_1–C_4-hydroxyalkyl;



in which

Q_1' is H or C_1–C_4-alkyl; and

Q_2' and Q_3' are C_1–C_4-alkyl, phenyl or tolyl;

R_1' is H, CN, CF_3, COX_1' or $CONX_1'X_2'$;

R_3' is H, chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy or $SO_2NX_1'X_2'$;

R_4' is H, chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy;

R_5' is H, chlorine, C_1–C_4-alkyl or phenyl;

X_1' is C_1–C_4-alkyl, phenyl, benzyl or phenethyl; and

X_2' and X_3' independently of one another represent C_1–C_4-alkyl, phenyl, benzyl or phenethyl.

4,179,437

AMINO ACID DERIVATIVES OF 6-(2-AMINO-2-ARYLACETAMIDO) PENICILLANIC ACIDS

Yoshiharu Morita; Kenzo Omata, both of Yokohama; Junichi Ohya, Zama; Kazuo Wagatsuma, Yokohama, and Tadashi Shirasaka, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 713,808, Aug. 12, 1976, Pat. No. 4,111,932. This application Apr. 24, 1978, Ser. No. 899,458

Claims priority, application Japan, Sep. 8, 1975, 50/108708; Sep. 8, 1975, 50/108709; Feb. 5, 1976, 51/12119; Feb. 6, 1976, 51/12121; Feb. 14, 1976, 51/15335; Feb. 16, 1976, 51/15563

The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.

Int. Cl.[2] C07D *499/68*

U.S. Cl. 260—239.1 **1 Claim**

1. 6-(D-2-prolylamino-2-phenylacetamido) penicillanic acid and non-toxic pharmaceutically acceptable salts thereof.

4,179,438

PROCESS FOR THE PREPARATION OF 3 IODO- AND 3 BROMORIFAMYCIN S

Egidio Marchi, and Lauretta Montecchi, both of Bologna, Italy, assignors to Alfa Farmaceutici, S.p.A., Bologna, Italy

Filed Nov. 6, 1978, Ser. No. 957,844

Claims priority, application Italy, Nov. 29, 1977, 3620 A/77

Int. Cl.[2] C07D *498/08*

U.S. Cl. 260—239.3 P **5 Claims**

1. Improved process for the preparation of 3 iodo- and 3 bromorifamycin S characterized by the fact that rifamycin S is made to react with at least two equivalents of an halogen selected from the group consisting of iodine and bromine, per mole of rifamycin S in the presence of at least one mole of pyridine per each equivalent of halogen and in the presence of ethanol, methanol or mixtures thereof with water, operating at a temperature not above the room temperature.

4,179,439

RIFAMYCINS AND METHOD FOR THEIR PREPARATION

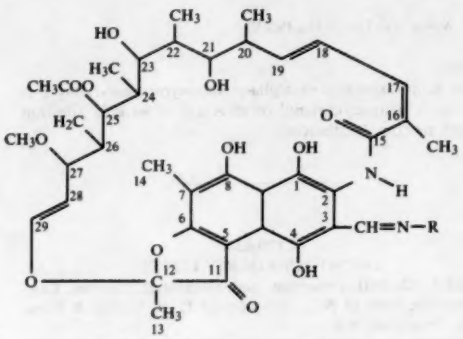
Alexandru Sauciuc, Iassi; Ion Nitelea; Eugeniu Paunescu, both of Bucharest; Constantin Diaconescu, Iassi; Margareta Albu, Iassi; Liliana Bulgaru, Iassi, and Eugen Diaconu, Iassi, all of Romania, assignors to Intreprinderea de Antibiotice Iassi, Iassi, Romania

Filed Jul. 1, 1977, Ser. No. 812,429

Int. Cl.[2] C07D *498/08*

U.S. Cl. 260—239.3 P **3 Claims**

1. A compound of the formula:



wherein R is

wherein

R^1 is hydrogen; and

R^2 is phenylpyridazinyl with the phenyl substituted with a 1 to 3 carbon alkyl group or a halogen atom.

4,179,440

EPOXY EMULSION WATER-BASED COATING USING WATER-DISPERSIBLE EPOXY EMULSIFIER

Carlos J. Martinez, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 909,858, May 26, 1958, abandoned. This application Dec. 26, 1978, Ser. No. 973,276

Int. Cl.[2] C08L *61/28*

U.S. Cl. 260—29.4 R **6 Claims**

1. An oil-in-water emulsion coating formulation containing in parts by weight:

(a) a capped epoxy resin having an epoxy equivalent weight between about 400 and about 6,000;

(b) a carboxyl functional epoxy resin having an epoxy equivalent weight between about 400 and about 6,000 having an acid number between about 35 and about 150 or a carboxyl functional capped epoxy resin having an epoxy equivalent weight between about 400 and about 6,000 having an acid number between about 35 and about 150;

(c) the ratio of (a):(b) being between about 90 parts:10 parts and about 10 parts:90 parts, the relative proportions of the following components, based upon (a) plus (b) being 100 parts;

(d) sufficient tertiary amine, ammonia, or ammonium hydroxide to neutralize (b) to a pH of about 7.0 to about 9.1;

(e) between about 25 parts and about 160 parts of an alkoxyethanol solvent having the formula $ROCH_2CH_2OH$, wherein R is C_{5-7} alkyl, or a mixture of said alkoxyethanol and at least one co-solvent, selected from the group con-

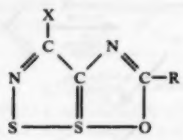
sisting of alkoxy alcohols, and ketones, containing at least about 30 weight percent of said alkoxyethanol;
(f) between about 0 part and about 2 parts of an acid cross-linking catalyst;
(g) between about 1 part and about 30 parts of a conventional curing agent for an epoxy resin; and
(h) between about 200 parts and about 600 parts of water.

4,179,441
FUNGIDAL AND HERBICIDAL 2-SUBSTITUTED-3-OXA-3Aλ⁴, 4-DITHIA-6-HALO-1,5-DIAZAPENTALENE

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 30, 1977, Ser. No. 866,122
Int. Cl.² C07D 277/20
U.S. Cl. 548—122 **10 Claims**

1. A compound of the formula



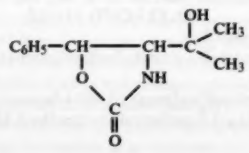
wherein X is chloro or bromo and R is alkyl of 1 to 6 carbon atoms; haloalkyl of 1 to 6 carbon atoms and of 1 to 3 of the same or different halogen selected from fluoro, chloro, bromo or iodo; halovinyl of 1 to 3 of the same or different halogens selected from fluoro, chloro, bromo or iodo; cycloalkyl of 3 to 6 carbon atoms; thiocyanatoalkyl of 1 to 3 carbon atoms; phenyl or phenoxy substituted with up to 3 of the same or different substituents selected from hydroxy, fluoro, chloro, bromo, iodo, trifluoromethyl, trichloromethyl, tribromomethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonylalkoxy of 3 to 6 carbon atoms, nitro, cyano, thiocyanato or isothiocyanato; phenoxymethyl or phenylthiomethyl wherein the phenyl ring is substituted with up to 3 of the same or different substituents selected from fluoro, chloro, bromo, iodo or alkyl of 1 to 4 carbon atoms; benzyloxymethyl or benzylthiomethyl wherein the benzyl ring is substituted with up to 2 of the same or different substituents selected from fluoro, chloro, bromo, iodo, or alkyl of 1 to 4 carbon atoms; furyl; or thienyl.

4,179,442
4-(ALPHA-HYDROXY-ISOPROPYL)-5-PHENYL-OXAZOLIDIN-2-ONE

Friedrich-Gero Köllensperger, Galvanistrasse 20, Linz, Austria; York Hartleben, Kleiner Ring 7, 2081 Heist, Fed. Rep. of Germany; Rolf Kretzschmar, An der Düne 2, 2082 Moorrege, Fed. Rep. of Germany, and Bernhard Neteler, Huntestrasse 13, 29 Oldenburg, Fed. Rep. of Germany

Division of Ser. No. 718,610, Aug. 30, 1976, Pat. No. 4,139,538. This application Aug. 9, 1978, Ser. No. 932,102
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1975, 2538424
Int. Cl.² C07D 263/24
U.S. Cl. 548—232 **1 Claim**

1. 4-[1'(1'-Hydroxy-1'-methyl)-ethyl]-5-phenyl oxazolidin-2-one corresponding to the formula



4,179,443
6-CHLORO-1,2,3,4-TETRAHYDROCARBAZOLE-2-ONE

Leo Berger, Montclair, and John W. Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 914,465, Jun. 12, 1978. This application Dec. 21, 1978, Ser. No. 972,142
Int. Cl.² C07D 209/88
U.S. Cl. 260—315 **1 Claim**

1. 6-Chloro-1,2,3,4-tetrahydrocarbazole-2-one.

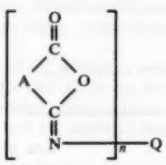
4,179,444
PROCESS FOR THE MANUFACTURE OF ISO-IMIDES OR MIXTURES OF ISO-IMIDES AND IMIDES

Martin Roth, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 764,624, Feb. 1, 1977, abandoned. This application May 22, 1978, Ser. No. 908,338
Claims priority, application Switzerland, Feb. 11, 1976, 1648/76
Int. Cl.² C07D 403/10
U.S. Cl. 260—326 N **9 Claims**

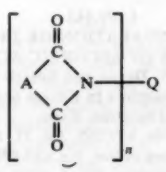
1. Process for the manufacture of an iso-imide of the formula I

(I)

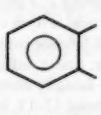


or a mixture of an iso-imide of the formula I and an imide of the formula Ia

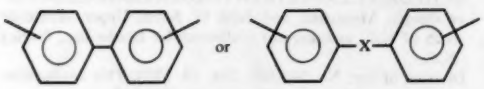
(Ia)



in which A represents —CH=CH— or



n represents the number 1 or 2 and, when n=1, Q represents a phenyl, 1-naphthyl or 2-naphthyl group; and, when n=2, represents a phenylene or naphthylene group; or said phenyl, naphthyl, phenylene or naphthylene group substituted by 1 or 2 moieties which are free from acid hydrogen atoms and which are selected from the group consisting of halogen, alkyl with 1 to 8 carbon atoms, halogenoalkyl with 1 to 3 carbon atoms, alkylthio with 1 to 4 carbon atoms, N,N-dialkylamino with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, phenoxy, alkoxycarbonyl with 2 to 5 carbon atoms, alkanoyl with 2 to 5 carbon atoms, phenylsulphonyl, alkylsulphonyl with 1 to 4 carbon atoms, cyano and nitro; or when n=2, Q also represents a group of the formulae



in which X denotes the bridge member —O—, —S—, —S—S, $-SO_2-$, $-CH_2-$, —CO— or

which process comprises reacting an amide-acid of the formula II

(II)

in which that stated under formula I applies in respect of A, Q and n, with ketene at a temperature of about −10° C. to +80° C.

4,179,445

METHOD OF PREPARATION OF 2-PHOSPHATE ESTERS OF ASCORBIC ACID

Paul A. Sieb; Charles W. Deyoe, and Russell C. Hoseney, all of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 817,555, Jul. 21, 1977, abandoned, which is a continuation of Ser. No. 683,888, May 6, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,669

Int. Cl.[2] C07F *9/09*

U.S. Cl. 260—340.9 R **3 Claims**

1. A method of preparing a 2-phosphated ester of 5,6-isopropylidene-L-ascorbic acid which comprises the steps of:

admixing a quantity of 5,6-isopropylidene-L-ascorbic acid, a quantity of pyridine, and a sufficient amount of an alkali metal hydroxide to initially elevate the pH of the admixture to a level of about 12–13, in water,

said 5,6-isopropylidene-L-ascorbic acid being present in said admixture at a concentration of from about 0.3 to 0.6 molar, said pyridine being present in said admixture at a concentration of from about 1.5 to 3.0 molar; and adding a quantity of phoshorous oxychloride to said admixture, and reacting the components of said admixture at a temperature of from about −10° to 10° C., and, during said reaction, adding additional quantities of said phosphorous oxychloride and said hydroxide to said admixture, said hydroxide being added for maintaining said pH at a level of from about 12–13 throughout the entirety of the reaction, in order to form primarily a 2-phosphated ester of said 5,6-isopropylidene-L-ascorbic acid.

4,179,446

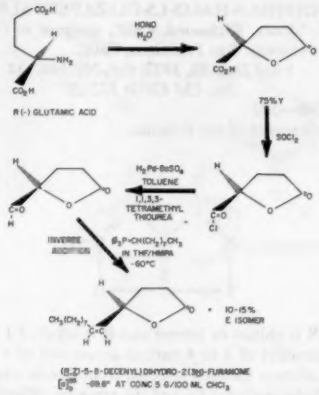
SEX PHEROMONE PRODUCED BY THE FEMALE JAPANESE BEETLE: SPECIFICITY OF MALE RESPONSE TO ENANTIOMERS

James H. Tumlinson, III, Gainesville, Fla.; Michael G. Klein, Wooster, Ohio; Robert E. Doolittle, Gainesville, Fla., and Thyril L. Ladd, Jr., Wooster, Ohio, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 8, 1978, Ser. No. 932,079

Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—343.6 **2 Claims**



1. A process for preparing (R,Z)-5-(1-decenyl)dihydro-2-(3H)-furanone comprising:

(a) deaminating R(−)glutamic acid by reacting it with sodium nitrate to produce R(−)5-carboxydihydro-2(3H) furanone;

(b) heating the R(−)5-carboxydihydro-2(3H)furanone with thionyl chloride to produce the acid chloride from (b);

(c) reducing the acid chloride from (b) to the corresponding aldehyde;

(d) reacting the aldehyde from (c) with ylide generated with butyl lithium from nonyltriphenyl-phosphorium bromide to produce a mixture of the Z- and E-isomers of the pheromone (R,Z)-5-(1-decenyl)dihydro-2(3H) furanone; and

(e) separating the Z isomer from the E isomer by liquid chromatography.

2. The compound (R,Z)-5-(1-decenyl)dihydro-2(3H)-furanone.

4,179,447

PROCESS FOR THE PRODUCTION OF 2-SUBSTITUTED CHROMONES

David T. Connor, Ann Arbor, Mich.; Patricia A. Young, Madison, N.J., and Max von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 816,122, Jul. 15, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 964,998

Int. Cl.[2] C07D *311/22*

U.S. Cl. 260—345.2 **3 Claims**

1. 7,8-dimethyl-2-[(methylsulfinyl)methyl]-4H-1-benzopyran-4-one.

2. 2-[(methyl-sulfinyl)methyl]-4H-1-benzopyran-4-one.

3. 7-methoxy-2-[(methylsulfinyl)methyl]-4H-1-benzopyran-4-one.

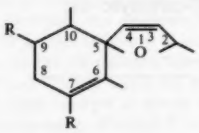
4,179,448

SPIRANE DERIVATIVES USEFUL AS PERFUMING AND FLAVOR-MODIFYING INGREDIENTS

Karl-Heinrich Schulte-Elte; Peter Fankhauser, both of Onex, and Günther Ohloff, Bernex, all of Switzerland, assignors to Firmenich, S.A., Geneva, Switzerland

Filed Oct. 11, 1977, Ser. No. 841,124
Int. Cl.[2] C07D *307/94*
U.S. Cl. 260—346.11 3 Claims

1. A compound having the formula



wherein one of the symbols R represents a methyl group and the other a hydrogen atom.

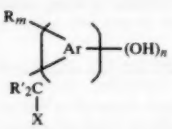
4,179,449

HALOALKYL HYDROXY-AROMATIC CONDENSATION PRODUCTS AS FUEL AND LUBRICANT ADDITIVES

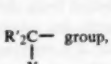
David E. Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 684,818, May 10, 1976, Pat. No. 4,108,783, which is a continuation-in-part of Ser. No. 459,424, Apr. 9, 1974, abandoned. This application Aug. 11, 1978, Ser. No. 932,977
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.74 19 Claims

1. A reaction product made by the process comprising reacting at a temperature ranging from about 15° C. to the decomposition temperature of the reactant or product present having the lowest decomposition temperature (A) at least one alpha haloalkyl hydroxyl aromatic compound of the general formula

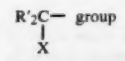


wherein Ar is a hydrocarbyl aromatic nucleus of 6 to about 30 carbon atoms, or a substituted analog of such an aromatic nucleus substituted with one or more up to 3 each of lower alkoxy, lower alkylthio, chloro, or nitro substituents, each R is a nonfused hydrocarbyl group of about 25 to about 700 carbon atoms, X is a halogen atom, each R′ is independently a hydrogen atom, an alkyl group of 1 to 36 carbon atoms, or a halogen-substituted alkyl group of 1 to about 36 carbon atoms, n is 1 to 3 and m is 1 to 5 with the provisos that (i) the total number of carbon atoms in both the R′ groups does not exceed 36 and (ii) where m exceeds 1, one of the R groups can also be a



with

(B) at least one alpha-beta olefinically unsaturated compound selected from the group consisting of C_{2-40} hydrocarbyl nitriles, C_{2-40} hydrocarbyl carboxylic acids and anhydrides, esters, amides and ammonium and metal salts of said C_{2-40} carboxylic acids, the reaction of (A) with (B) resulting in the formation of a carbon-to-carbon bond, said bond including the carbon of at least one



wherein the ratio of (A) to (B) between 0.5:1 to about 2:1.

4,179,450

PROCESS FOR THE PREPARATION OF 1-ACYLAMINO-5(8)-CHLOROANTHRAQUINONES

Detlef-Ingo Schütze, Bergisch-Gladbach, Fed. Rep. of Germany; Hans-Samuel Bien, deceased, late of Burscheid, Fed. Rep. of Germany (by Else Bien, Gabriele Bien, Dorothee Bien, legal representatives); Petra Bien, heir, and Daniel Bien, heir, both of Burscheid, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1977, Ser. No. 794,143
Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620372
Int. Cl.[2] C07C *97/24, 103/75*
U.S. Cl. 260—377 10 Claims

1. In a process for the preparation of 1-acylamino-5-chloroanthraquinone or 1-acylamino-8-chloroanthraquinone by acylation of the corresponding monoaminochloroanthraquinone, the improvement comprising

(a) aminating 1,5-dichloroanthraquinone or 1,8-dichloroanthraquinone with aqueous ammonia at temperatures from 190° C. to 240° C. to form a mixed amination product of the corresponding diaminoanthraquinone and at least 50% of the corresponding mono-(1)-aminochloroanthraquinone;

(b) acylating the mixed amination product at a temperature from 100° C. to 180° C. in an inert organic solvent in which the acylated monoaminochloroanthraquinone is readily soluble and the acylated diaminoanthraquinone is sparingly soluble; and

(c) separating the resultant monoacylaminochloroanthraquinone product from the diacylaminoanthraquinone product by recovery of the monoacylaminochloroanthraquinone product from the solvent.

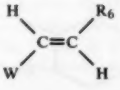
4,179,451

NOVEL HYDROXY SUBSTITUTED 15-DEOXY-5-CIS-PROSTENOIC ACIDS AND ESTERS

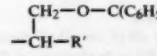
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; William J. McGahren, Demarest, N.J., and Robert E. Schaub, Upper Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 607,867, Aug. 26, 1975, Pat. No. 4,107,441, which is a continuation-in-part of Ser. No. 370,256, Jun. 15, 1973, abandoned. This application Jun. 12, 1978, Ser. No. 914,770
Int. Cl.[2] C07C *43/27, 43/28*
U.S. Cl. 260—395 5 Claims

1. A compound selected from the group consisting of those of the formula:



and the optical isomers, enantiomers, diastereomers, racemates and racemic mixtures thereof wherein R_6 is selected from the moieties consisting of those of the formulae:



and

$-CH_2-R_8$

wherein R' is a straight chain alkyl or alkenyl group having from 3 to 10 carbon atoms or a straight chain alkyl or alkenyl group having from 3 to 7 carbon atoms and having one or two branched alkyl groups each of from 1 to 3 carbon atoms; and R_8 is a straight chain alkyl or alkenyl group having from 3 to 10 carbon atoms and substituted with a triphenylmethoxy group or a straght chain alkyl or alkenyl group having from 3 to 7 carbon atoms and having one or two branched alkyl groups each of from 1 to 3 carbon atoms and substituted with a triphenylmethoxy group with the proviso that when R_8 is alkenyl then the triphenylmethoxy group must be on a saturated carbon atom; and W is selected from the group consisting of iodine and lithium atoms.

4,179,452

3α,6α-DIHYDROXY-5β-CHOLESTAN-24-ONE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Kiyoshige Ochi, Kawagoe; Isao Matsunaga; Minoru Shindo, both of Tokyo, and Chikara Kaneko, Kanazawa, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

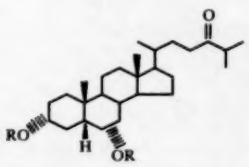
Filed May 17, 1978, Ser. No. 906,866

Claims priority, application Japan, May 23, 1977, 52/58815

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.2 **5 Claims**

1. A 3α,6α-dihydroxy-5β-cholestan-24-one derivative represented by the formula



wherein R is hydrogen, acyl, triarylmethyl, methoxymethyl, tetrahydropyranyl, alkylsilyl or benzyl.

4,179,453

PROCESS FOR PREPARING 17β-CARBOXY-5-ANDROSTEN-3-ONES

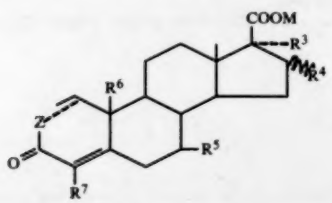
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 13, 1978, Ser. No. 896,120

Int. Cl.[2] C07J *9/00*

U.S. Cl. 260—397.1 **4 Claims**

1. A method for preparing a 17β-carboxy-4-androsten-3-one having the formula:



where

R^3, R^4, R^5, and R^6 are the same or different and are hydrogen or lower alkyl;

R^7 is hydrogen or cyano;

M is hydrogen, lower alkyl, or alkali metal;

Z is CH—R^9 where R^9 is hydrogen, α-fluoro, or α-lower alkyl; and the dotted line between positions 1 and 2 represents the possibility of a single bond when Z is CH—R^9 and a double bond when Z is C—R^9; comprising the steps of

(1) reacting a 17β-(1-ketoethy)-5-androsten-3-ol with pyridine and iodine to form a pyridinium iodide compound;

(2) reacting the pyridinium iodide compound with alkali metal methoxide in methanol to form a methyl-5-androsten-3-ol-17β-carboxylate;

(3) oxidizing the 5-androsten-3-ol to form methyl-4-androsten-3-one-17β-carboxylate; and

(4) hydrolyzing the methyl-17β-carboxylate to the corresponding 17β-carboxylic acid.

4,179,454

PRODUCTION OF HYDROGENATED FATTY ACIDS FROM CRUDE GLYCERIDE OILS

Anil B. Mehta, Strongsville, and Richard J. Zielinski, Middleburg Heights, both of Ohio, assignors to SCM Corporation, Cleveland, Ohio

Filed Jul. 24, 1978, Ser. No. 927,452

Int. Cl.[2] C11C *3/12, 1/04*

U.S. Cl. 260—409 **10 Claims**

1. A process for producing hydrogenated fatty acids which comprises:

subjecting a crude glyceride oil to hydrogenation in a hydrogenation zone with hydrogen gas under hydrogenation conditions in the presence of a hydrogenation catalyst;

discontinuing said hydrogenation after at least a significant increase in saturation of said oil has occurred;

passing said hydrogenated crude oil into a splitting zone and therein splitting said hydrogenated oil under oil splitting conditions into component hydrogenated fatty acids and by-product glycerine; and

withdrawing said hydrogenated fatty acids and said by-product glycerine from said splitting zone.

4,179,455

PROCESS FOR THE PRODUCTION OF MODIFIED VEGETABLE FATS

Raghuram D. Shenoy, and Anantharam Ganapathy, both of Bombay, India, assignors to Cadbury India Limited, Bombay, India

Filed Jan. 25, 1978, Ser. No. 872,145

Int. Cl.[2] C11C *3/12;* **A23D** *5/00;* **A23G** *1/00*

U.S. Cl. 260—409 **9 Claims**

1. A process for the production of modified vegetable fats which comprises the steps of:

(a) partially hydrogenating a refined, bleached and deodorized vegetable fat selected from the group which consists of sal seed fat, Mowrah fat, phulwara fat and mixtures thereof in the presence of a conventional metal catalyst to obtain hardened fat of an iodine value in the range of about 35 to 38 and containing less than about 2% of trisaturated glycerides;

(b) allowing the hardened fat formed during step (a) to remain for 3 to 4 days at a temperature of 20° to 35° C.; and

(c) following step (b) subjecting the hardened fat to hydraulic pressure within a range of 200 to 700 p.s.i. under a controlled temperature range of about 20° to 35° C. to remove liquid oil.

4,179,456

PROCESS FOR THE PRODUCTION OF MODIFIED VEGETABLE FATS

Raghuram D. Shenoy, and Anantharam Ganapathy, both of Bombay, India, assignors to Cadbury India Limited, Bombay, India

Filed Jan. 25, 1978, Ser. No. 872,150
Int. Cl.[2] C11C 3/12; A23D 5/00; A23G 1/00
U.S. Cl. 260—409 8 Claims

1. A process for the production of modified vegetable fat which comprises the steps of:

(a) partially hydrogenating at a temperature of 100° to 180° C. a refined, bleached, and deodorized vegetable fat selected from the group consisting of sal seed fat, mowrah fat, phulwara fat and the mixtures thereof and containing glycerides of C_{16}, C_{18} and C_{20} acids, in the presence of a conventional metal catalyst to obtain hardened fat of an iodine value in the range of about 33 to 36 and containing less than about 2% trisaturated glycerides; and

(b) removing from said hardened fat high melting glycerides by thermal crystallization at a temperature of about 30° C. to 40° C. and recovering a low melting fat having an iodine value of about 37–40.

4,179,457

CONVERSION OF FATTY ACID ESTERS TO FATTY ACIDS

Richard R. Crawford, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,281
Int. Cl.[2] C11C 1/04; C11D 13/00
U.S. Cl. 260—418 10 Claims

1. Process for obtaining fatty acids from the lower alkyl esters of said acids which comprises the steps of

(a) dissolving said esters in a solvent consisting essentially of water and from about 25 to about 300 parts by weight of a lower alcohol,

(b) saponifying said ester solution with an alkali metal hydroxide,

(c) mixing a sufficient quantity of an acidic substance with said solution to lower the pH to between about 5 and about 8,

(d) distilling the mixture to remove solvent therefrom,

(e) mixing additional acidic substance with the mixture to lower the pH thereof to between about 1 and about 4, and

(f) washing the reaction product to obtain said fatty acid.

4,179,458

PROCESS FOR PREPARING ORGANOTIN COMPOUNDS

Trevor E. Jones, Halesowen, England, assignor to Albright & Wilson Limited, Warley, England

Filed Jan. 13, 1977, Ser. No. 759,179
Claims priority, application United Kingdom, Jan. 14, 1976, 1461/76; Jul. 19, 1976, 29937/76
The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.
Int. Cl.[2] C07F 7/22
U.S. Cl. 260—429.7 24 Claims

1. A process for preparing organotin compounds containing at least 50% tetraorganotin and at most 50% triorganotin halide which comprises reacting an organic halide of formula RX where R is an alkyl group of 1 to 20 carbon atoms or alkenyl group of 2–20 carbon atoms and X is a chlorine, bromine or iodine atom, with a heated suspension of metallic material selected from the group consisting of (i) a mixture of zinc and tin, and (ii) an alloy consisting essentially of tin and zinc, the atomic proportion of zinc to tin in said material being at least 0.5:1, in a liquid comprising at least one 'onium salt, which is an organic quaternary ammonium or phosphonium salt or tertiary sulphonium salt, to produce a mixture containing tetraorganotin, and at least some of said tetraorganotin is in the liquid.

4,179,459

PROCESS FOR THE SYNTHESIS OF MIXED POLYIMINO DERIVATIVES OF ALUMINIUM AND ALKALINE EARTH METALS

Giovanni Dozzi, Milan; Salvatore Cucinella, and Alessandro Mazzei, both of San Donato Milanese, all of Italy, assignors to ANIC S.p.A., Palermo, Italy

Filed Sep. 7, 1977, Ser. No. 831,240
Claims priority, application Italy, Oct. 28, 1976, 28776 A/76; Oct. 28, 1976, 28777 A/76
Int. Cl.[2] C07F 5/06
U.S. Cl. 260—448 R 9 Claims

1. A process for the synthesis of mixed polyimino derivatives of aluminum and alkaline earth metals, said process consisting of reacting aluminum, a primary or secondary amine, and an alkaline earth metal or a hydride or amide derivative thereof, in the presence of hydrogen.

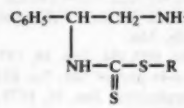
4,179,460

DERIVATIVES OF R,S-[X2-(2-HYDROXYETHYLAMINO)-1-PHENYL]-ETHYLAMINE, AND PROCESS

Atanas G. Georgiev; Hristo P. Daskalov; Ventzel G. Michaylov, and Kina V. Konstantinova, all of Sofia, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Filed Jun. 30, 1978, Ser. No. 921,003
Claims priority, application Bulgaria, Jul. 6, 1977, 37908
Int. Cl.[2] C07C 153/09
U.S. Cl. 260—455 R 4 Claims

1. An R,S-[2-(2-hydroxyethylamino)-1-phenyl]-ethylamine of the formula III



(III)

wherein R represents hydrogen or allyl,

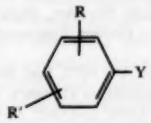
4,179,461

PROCESS FOR THE PREPARATION OF DIPHENYL ETHERS

Albrecht Marhold, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

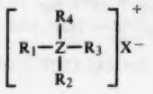
Continuation of Ser. No. 731,474, Oct. 12, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,464
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1975, 2547037
Int. Cl.[2] C07C 41/00
U.S. Cl. 260—465 H 3 Claims

1. In a process for the preparatior of a diphenyl ether substituted in the 4,4′-position and/or the 2,2′-position relative to the ether oxygen atom by reaction of a reactive benzene compound substituted in the 1- and in the 2- or 4-position, said reactive benzene compound having the formula



in which Y denotes a halogen atom or the nitro group, R denotes an NO_2, CN or R″SO_2 group which is in the ortho-

position or para-position relative to Y, and R′ denotes hydrogen fluorine, chlorine, a C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylmercapto radical, which is optionally substituted by halogen, or the $N(R'')_2$ radical in which R″ represents alkyl or aryl which is optionally substituted by halogen, with an alkali or alkaline earth metal nitrite at 100°–220° C., the improvement which comprises carrying out the reaction in the presence of a quaternary onium salt in water, said quaternary onium salt having the formula



in which Z represents nitrogen or phosphorous, R_1, R_2, R_3 and R_4 represent C_{1-18} alkyl radicals, aralkyl radicals in which the aryl portion is a benzyl radical which is optionally substituted by C_{1-4} alkyl radicals, a methoxy group or halogen, a phenyl radical which is optionally substituted by C_1–C_4 alkyl, C_1–C_2 alkoxy or by halogen or a cycloalkyl radical selected from the group consisting of cyclopentyl and cyclohexyl which cycloalkyl radical can be optionally substituted by a C_1–C_4 alkyl radical, or two adjacent radicals amongst R_1, R_2, R_3 and R_4 together with the central atom Z and optionally further heteroatoms, form a heterocyclic structure containing oxygen, sulfur or nitrogen in the ring, said heterocyclic structure being a 5- or 6-membered ring and X^- represents a halide, cyanide or hydroxy ion.

4,179,462

PROCESS FOR PREPARING ACETONITRILE

Gisela Olivé, and Salvador Olivé, both of Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 699,284, Jun. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,550, Jun. 30, 1975, abandoned. This application Jan. 16, 1978, Ser. No. 869,400

Int. Cl.[2] C07C *120/00, 121/18, 121/32*

U.S. Cl. 260—465.1 **34 Claims**

1. The process of preparing acetonitrile, by contacting carbon monoxide, hydrogen and ammonia at a temperature of at least about 350° C. and sufficiently high to induce reaction in the presence of a catalytically effective amount of catalyst comprising a transition metal in a reduced valence state which renders it effective toward the synthesis of acetonitrile, and recovering acetonitrile, said transition metal consisting essentially of transition metal other than copper, the temperature being sufficiently high at the pressure employed to cause acetonitrile production to predominate over amine production.

4,179,463

2-AMINO-CYCLOPENT-1-ENE-1-DITHIOCARBOXYLIC ACIDS

György Matolcsy; Piroska Bartok, née Berencsy, both of Budapest; Bella Kiss, Vecses; Eva Palosi, Budapest; Egon Karpati, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

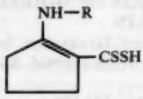
Filed Dec. 29, 1977, Ser. No. 865,426

Claims priority, application Hungary, Dec. 30, 1977, RI 609

Int. Cl.[2] C07C *153/043;* **A61K** *31/185*

U.S. Cl. 260—502.6 **6 Claims**

1. A 2-(substituted amino)-cyclopent-1-ene-1-dithiocarboxylic acid of the formula I



(I)

wherein R is, C_{1-6} alkyl having a C_{1-4} alkoxy, hydroxy, and both a carboxy and an amino substituent.

4,179,464

PREPARATION OF N-(PHOSPHONOACETYL)-L-ASPARTIC ACID

Robert J. Schultz, 68 Tomcyn Dr., Amherst, N.Y. 14221, and Fred W. Starks, 742 Highland Ave., Kenmore, N.Y. 14223

Continuation-in-part of Ser. No. 851,382, Nov. 14, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,501

Int. Cl.[2] C07F *9/38*

U.S. Cl. 260—502.5 **7 Claims**

1. In a method for the preparation of a sodium salt of N-(phosphonoacetyl)-L-aspartic acid, the improvement which comprises reacting L-aspartic acid with benzyl alcohol and p-toluenesulfonic acid monohydrate to obtain L-aspartic acid, dibenzyl ester p-toluenesulfonate, and reacting said L-aspartic acid, dibenzyl ester p-toluenesulfonate with triethylamine, followed by the addition of phosphonoacetyl chloride to produce the N-(phosphonoacetyl)-L-aspartic acid moiety in the form of the dibenzyl ester, wherein the carboxyl groups of the N-(phosphonoacetyl)-L-aspartic acid are esterified and unreacted phosphonoacetyl chloride is separated therefrom, and hydrolyzing the dibenzyl ester to obtain a sodium salt of N-(phosphonoacetyl)-L-aspartic acid.

4,179,465

N-FLUOROMETHYL-CARBAMIC ACID FLUORIDES AND THEIR MANUFACTURE

Sabine Thym, Heidelberg-Dossenheim; Karl-Heinz Koenig, Frankenthal, and Gerhard Hamprecht, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

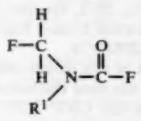
Filed Jan. 13, 1978, Ser. No. 869,383

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706683

Int. Cl.[2] C07C *51/58, 125/00*

U.S. Cl. 260—544 C **5 Claims**

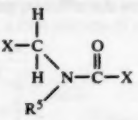
1. A process for the manufacture of a N-fluoromethyl-carbamic acid fluoride of the formula



I

where R^1 is a cycloaliphatic radical or is

where R^2, R^3 and R^4 may be identical or different and each is hydrogen or an aliphatic radical, and in addition R^2 may be fluorine if R^3 and R^4 are each hydrogen, wherein a halomethyl-carbamic acid halide of the formula



II

where the individual radicals X are each chlorine or bromine and R^5 has the same meaning as R^1 or, if R^2 is fluorine, may also represent

where X has the above meaning, is reacted at from 40° to 300° C. with a fluoride of a metal of groups Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, VIb, VIIb and VIIIb of the periodic table.

4,179,466

PHTHALIC DIANILIDES

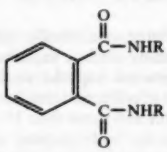
Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 546,236, Feb. 3, 1975, abandoned. This application Nov. 9, 1978, Ser. No. 959,286

Int. Cl.[2] A01N *5/00, 9/20;* **C07C** *103/78, 103/76*

U.S. Cl. 260—558 A **4 Claims**

1. A compound having the formula



wherein R is selected from the group consisting of 3'-trifluoromethylphenyl, 2'-chloro-5'-trifluoromethylphenyl and 3',5'-dimethoxyphenyl.

4,179,467

DOPAMINE HYDROXYLASE INHIBITING 2-AMINO-CYCLOPENT-1-ENE-1-THIOCARBOXYLIC ACID-DISULFIDES

György Matolcsy; Piroska Bartok nee Berencsy, both of Budapest; Bella Kiss, Vecses; Eva Palosi, Budapest; Egon Karpati, Budapest, and Laszlo Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

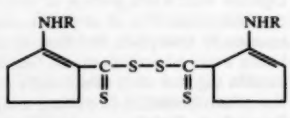
Filed Dec. 29, 1977, Ser. No. 865,429

Claims priority, application Hungary, Dec. 30, 1976, 610

Int. Cl.[2] C07C *87/02;* **A61K** *31/13*

U.S. Cl. 260—563 R **7 Claims**

1. A 2-amino-cyclopent-1-ene-thiocarboxylic acid disulfide of the formula



wherein R is C_{1-6} alkyl or C_{1-6} alkyl substituted with C_{1-4} alkoxy, C_{2-4} alkenyl or C_{3-8} cycloalkyl group.

4,179,468

CYCLIC TERPENOID ONIUM SALTS, THEIR PREPARATION AND USES

Bernard J. Kane, Atlantic Beach, and Richard A. Von Genk, Jacksonville, both of Fla., assignors to SCM Corporation, Cleveland, Ohio

Filed Jun. 19, 1978, Ser. No. 916,966

Int. Cl.[2] C07C *87/68*

U.S. Cl. 260—567.6 M **23 Claims**

1. A process for cyclizing an acyclic terpenoid group of an onium salt selected from a quaternary ammonium salt and a phosphonium salt, where said terpenoid group is a neryl group or a geranyl group, which comprises

maintaining an acidic aqueous solution of said onium salt at a temperature of at least about 80° C. until said acyclic terpenoid group cyclizes, there being at least about 1.1 equivalents of acid per equivalent of said onium salt.

4,179,469

PREPARATION OF AMINES

Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 20, 1978, Ser. No. 971,285

Int. Cl.[2] C07C *85/18*

U.S. Cl. 260—577 **18 Claims**

1. A process for the preparation of an amine which comprises dehydrogenating a dehydrogenatable compound at dehydrogenating conditions in the presence of a dehydrogenating catalyst, treating the resultant product mixture in the absence of any separation with carbon monoxide, hydrogen and a nitrogen-containing compound in the presence of a catalyst comprising a rhodium- or ruthenium-containing compound at reaction conditions, and recovering the resultant amine.

4,179,470

PROCESS FOR PRODUCING ANILINE WITH A PERMSELECTIVE PALLADIUM AND RUTHENIUM CATALYST

Alexandr P. Mischenko, Teply Stan, 2 mikroraion, korpus 24, kv. 426; Vladimir M. Gryaznov, Lomonosovsky prospekt, 14, kv. 504; Viktor S. Smirnov, Kutuzovsky prospekt, 26, kv. 555; Elena D. Senina, Sevastopolsky prospekt, 75, korpus 1, kv. 13; Iraida L. Parbuzina, Metrostroevskaya ulitsa, 3/14, kv. 44; Natalia R. Roshan, Yaroslavskoe shosse, 57, kv. 36; Viktoria P. Polyakova, ulitsa Trofimova, 15, kv. 201, and Evgeny M. Savitsky, ulitsa Dmitria Ulyanova, DNR-3, kv. 13, all of Moscow, U.S.S.R.

Filed Apr. 24, 1978, Ser. No. 899,418

Claims priority, application U.S.S.R., Aug. 12, 1977, 2521297[1]

Int. Cl.[2] C07C *85/11*

U.S. Cl. 260—580 **3 Claims**

1. A process for producing aniline, comprising subjecting nitrobenzene to catalytic hydrogenation using gaseous hydrogen at a temperature of from 20° to 260° C. and under atmospheric pressure, using a membrane catalyst which is essentially an alloy containing palladium and ruthenium, taken in a mass percent ratio of 88–98:12–2, respectively, said catalyst being permselective to hydrogen; the hydrogenation process being carried out by feeding nitrobenzene vapors on one side of the membrane catalyst and hydrogen, on the other side thereof.

4,179,471

CATALYTIC ALKYLATION OF ALKYL-SUBSTITUTED AROMATICS WITH MONOOLEFINS

Raymond L. Cobb, and Lawrence M. Fodor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1978, Ser. No. 969,599
Int. Cl.[2] C07C *3/52*
U.S. Cl. 585—452 **18 Claims**

1. A process comprising reacting a monoolefin hydrocarbon with an alkyl aromatic compound having a hydrogen bonded to at least one benzylic carbon of at least one alkyl group in the presence of a catalytic amount of alkali metal and a conversion promoting amount of a promoter composition comprising naphthalene, and at least one tertiary alcohol of the formula

wherein each R^2 is a hydrocarbyl radical having 1 to 4 carbon atoms and wherein each R^2 may be the same of different, or alkali metal salt of said tertiary alcohol, under such reaction conditions that at least one benzylic carbon of said alkyl aromatic compound is alkylated.

4,179,472

CATALYTIC ALKYLATION OF ALKYL-SUBSTITUTED AROMATICS WITH MONOOLEFINS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 14, 1978, Ser. No. 969,600
Int. Cl.[2] C07C *3/52*
U.S. Cl. 585—452 **38 Claims**

1. A process comprising reacting a monoolefin hydrocarbon with an alkyl aromatic compound having a hydrogen atom bonded to at least one benzylic carbon of at least one alkyl group in the presence of a catalytic amount of alkali metal and a conversion promoting amount of a promoter composition selected from the group consisting of (1) biphenyl and a conjugated diene hydrocarbon containing 4 to 12 carbon atoms per molecule, (2) biphenyl, a conjugated diene hydrocarbon containing 4 to 12 carbon atoms per molecule, and a tertiary amine and (3) naphthalene and a tertiary amine under such reaction conditions that at least one benzylic carbon of said alkyl aromatic compound is alkylated.

4,179,473

PRODUCTION OF MONOALKYL AROMATICS

Robert P. Cox, Wyckoff, N.J., assignor to The Lummus Company, Bloomfield, N.J.

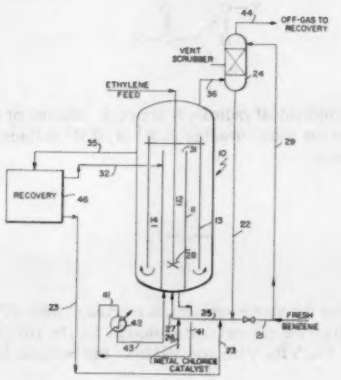
Filed Oct. 10, 1978, Ser. No. 950,243
Int. Cl.[2] C07C *3/54, 3/62*
U.S. Cl. 585—313 **5 Claims**

1. A process for producing a monoalkyl aromatic by reaction between olefin and aromatic, comprising:

introducing aromatic, olefin and alkylation catalyst into a combination alkylation-transalkylation reactor comprised of a central alkylation zone and a surrounding transalkylation zone, said aromatic and olefin being introduced into said alkylation zone and caused to flow cocurrently therethrough at alkyl aromatic production conditions to produce monoalkyl aromatic product and polyalkyl aromatic by-product, and then in plug flow through said surrounding transalkylation zone to effect transalkylation to monoalkyl aromatic;

withdrawing an effluent from the transalkylation zone containing monoalkyl aromatic product and polyalkyl aromatic by-product;

recovering monoalkyl aromatic product and polyalkyl aromatic by-product from the effluent; and



introducing polyalkyl aromatic by-product into the inlet portion of the transalkylation zone.

4,179,474

PROCESS FOR CONVERSION OF NAPHTHA TO ETHYLENE

Harold Beuther, Cheswick, and Harold E. Swift, Gibsonia, both of Pa., assignors to Gulf Research and Development Company, Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,404
Int. Cl.[2] C07C *5/04*
U.S. Cl. 585—251 **25 Claims**

1. A process comprising catalytically hydrotreating a feed naphtha stream containing olefins, naphthenes and aromatics to produce a hydrogenated naphtha stream containing less than 10 ppm by weight of sulfur and less than 5 volume percent of olefins plus aromatics and more than 10 volume percent of cycloparaffins, passing said hydrogenated naphtha stream to a pyrolysis zone, also passing to said pyrolysis zone a sulfur compound in an amount sufficient to increase the sulfur content based on hydrogenated naphtha to between about 20 and about 1,000 ppm by weight, operating said pyrolysis zone without added molecular hydrogen and without a catalyst at a temperature between 1,300° and 2,300° F. for a residence time between 0.05 and 2 seconds to produce a pyrolysis product containing ethylene and ethane wherein the ethylene yield is more than twice the ethane yield on a weight basis.

4,179,475

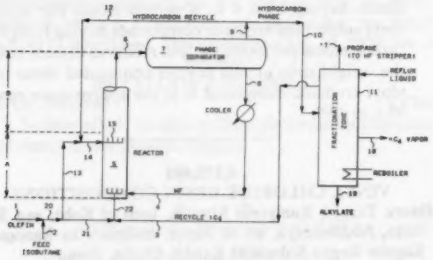
OLEFIN FEED IN HF ALKYLATION OF ISOPARAFFIN WITH OLEFIN

Donald J. Makovec, and Donald M. Haskell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1978, Ser. No. 905,073
Int. Cl.[2] C07C *3/54*
U.S. Cl. 585—714 **3 Claims**

1. The alkylation of an isoparaffin with an olefin in the presence of an acid catalyst which comprises introducing into one end of an elongated alkylation reaction zone a first portion of feed olefin together with a first portion of feed isoparaffin, together with recycled isoparaffin, at alkylation conditions for at least some reaction to take place and then downstream of said end introducing a second portion of said feed olefin, additional feed isoparaffin together with substantially all of a recycled hydrocarbon phase obtained in an ensuing settling zone, as hereinafter delineated, at alkylation conditions for additional reaction to take place, passing the effluent from said alkylation zone to said settling zone to separate a hydrocarbon phase

from an acid phase, recycling the acid phase to said alkylation zone, separating said hydrocarbon phase into at least two portions, recycling a first portion of said hydrocarbon phase as



said recycled hydrocarbon phase and passing another portion of said hydrocarbon phase to fractionation to withdraw an alkylate product.

4,179,476

SEMI-CONTINUOUS PROCESS FOR OBTAINING AMINO COMPOUNDS

Gerhard Franz, Frick, Switzerland; Georg Halfter, Wyhlen, Fed. Rep. of Germany; Walter Jaeckle, and Fritz Mindermann, both of Grenzach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 706,370, Jul. 19, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,443

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1975, 2534176

Int. Cl.[2] **C07C** *85/11, 143/56*

U.S. Cl. 260—706 **8 Claims**

1. In a process for the production of a water-soluble aromatic amine compound by the reduction of a corresponding nitro compound selected from the group consisting of nitrobenzene, 2-nitro-4-methylsulphonyl-phenol, 2-nitro-2'-sulpho-4,4'-dichloro-diphenyl ether, 4,4'-dinitro-stilbene-2,2'-disulphonic acid, nitrobenzenedisulphonic acid-2,5,3-nitrobenzenesulphonic acid, 6-nitro-2-naphthol-4-sulphonic acid or 2-chloro-5-nitrobenzoic acid, with iron in acidic aqueous medium, the improvement comprising, a semi-continuous process comprising the steps of

(1) providing an aqueous solution or suspension of the aromatic nitro compound in a first vessel,

(2) providing an acidic aqueous suspension of iron particles in a second vessel,

(3) introducing a less-than-stoichiometric amount of the suspension of the aromatic nitro compound from the first vessel into the second vessel,

(4) allowing the acidic suspension of iron to react with the aromatic nitro compound to yield to aromatic amine compound and iron oxide, at about 50° C. to about 110° C.,

(5) substantially separating the unreacted iron particles from the reaction mixture by removal of a substantial portion of the iron oxide, water and aromatic amine compound from the second vessel, while leaving the unreacted iron particles therein,

(6) repeating steps (3), (4) and (5) while maintaining the acidity and the stoichiometric excess of unreacted iron in the reaction mixture.

4,179,477

FAST CURING COATING COMPOSITION

Lawrence G. Bockstie, Jr., Bradford, Pa., assignor to Corning Glass Works, Corning, N.Y.

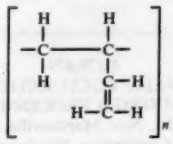
Filed Jul. 8, 1974, Ser. No. 486,395

Int. Cl.[2] **C08F** *279/02*

U.S. Cl. 525—284 **5 Claims**

1. A dielectric coating composition consisting essentially of

(a) from about 35 to 90 parts by weight of a polybutadiene resin system consisting essentially of 45 to 85 parts by weight of a polybutadiene resin having a molecular weight between about 750 to about 14,000, at least about 75 percent concentration of pendant vinyl groups and a molecular structure of



1 to 5 parts by weight of at least one catalyst selected from the group consisting of dicumyl peroxide, benzoyl peroxide, lauroyl peroxide, and t-butyl hydroperoxide, and up to 40 parts by weight of at least one reactive monomer selected from the group consisting of vinyl toluene, t-butylstyrene, alkyl substituted styrene and diallyl maleate, and

(b) from about 10 to 65 parts by weight of at least one silane selected from the group consisting of vinyltriethoxysilane, vinyl silane, vinyltriacetoxysilane, and vinyltrimethoxysilane.

4,179,478

PROCESS FOR THE PRODUCTION OF BINDERS

Hans J. Rosenkranz; Hans-Joachim Traenckner, and Karl Fuhr, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 914,999

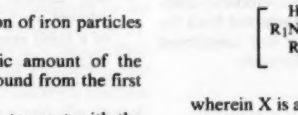
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727417

Int. Cl.[2] **C08L** *63/00*

U.S. Cl. 525—113 **5 Claims**

1. A process for the production of lacquer binders from 1,2-polyepoxides having more than one 1,2-epoxide group per molecule which comprises the steps of:

(a) reacting the 1,2-polyepoxide with from 0.01 to 0.6 NH-equivalents as hereinbefore defined, based on one epoxide equivalent, of a compound having the general formula (I)



wherein X is a hydrogen atom or a group H_2NR_1,R_2; and R_1 and R_2 are the same or different and each is a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, a cyclopentyl group, a cyclohexyl group, a hydroxyalkyl group having from 2 to 18 carbon atoms in the alkyl moiety, an alkoxylalkyl group having from 1 to 4 carbon atoms in the alkoxy moiety and from 2 to 18 carbon atoms in the alkyl moiety, an alkoxy carbonylalkyl group having from 1 to 4 carbon atoms in the alkoxy moiety and from 2 to 18 carbon atoms in the alkyl moiety, an N-dialkylaminoalkyl group having from 2 to 18 carbon atoms in the alkyl moiety and from 1 to 4 carbon atoms in the N-dialkylamino moiety, a carboxyalkyl group having from 1 to 6 carbon atoms in the alkyl moiety, an aminoalkyl group having from 2 to 6 carbon atoms, an aminoalkyl group having from 2 to 6 carbon atoms in the alkyl moiety and having the carbon chain thereof interrupted by one or more —NH— or —N(CH_3)-groups; or R_1 and R_2 together with the nitrogen atom to which they are both attached form a piperidine or pyrrolidine ring structure;

(b) reacting the thus obtained compound with from 0.40 to 0.90 carboxyl equivalent as hereinbefore defined, based on

one epoxide equivalent of acrylic acid, methacrylic acid or a mixture thereof; and optionally

(c) reacting the compound obtained from step (b) with from 0.40 to 0.2 carboxyl equivalents as hereinbefore defined, based on one epoxide group, or a saturated aliphatic monocarboxylic acid;

so that at least 80% of the epoxide groups originally present are reacted.

4,179,479

THERMOPLASTIC POLYURETHANE BLENDS CONTAINING A PROCESSING AID

Russell P. Carter, Jr., New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1978, Ser. No. 897,982

Int. Cl.[2] C08L *75/00*

U.S. Cl. 525—66 **4 Claims**

4. The composition of claim 2, wherein component (B) comprises a thermoplastic polycarbonate.

4,179,480

BLENDS OF CYCLODIENE-CONTAINING COPOLYMERS AND BLOCK COPOLYMERS HAVING IMPROVED HIGH TEMPERATURE GREEN TENSILE STRENGTH

Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 5, 1976, Ser. No. 739,175

Int. Cl.[2] C08L *53/02*

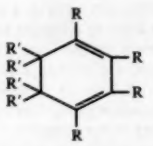
U.S. Cl. 525—99 **16 Claims**

9. A composition of matter consisting essentially of:

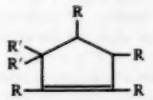
(a) a block copolymer represented by the formula $Z(B\text{-}A)_n$ wherein A is an essentially homopolymer block of a vinyl aromatic compound and Z is selected from the group consisting of an essentially homopolymer block of a conjugated diene having from 4 to 8 carbon atoms and a random copolymer block of said conjugated diene and said vinyl aromatic compound wherein the weight ratio of said vinyl aromatic compound to said conjugated diene is in the approximate range of 1:4 to 4:1, Z is derived from a polyfunctional compound having 3 or 4 reactive sites, and n is an integer having a value of 3 or 4, and

(b) from 5 to 100 parts of a copolymer of cyclodiene per 100 parts of said block copolymer, wherein said copolymer of cyclodiene is prepared by polymerizing a mixture of

(1) from 10 to 90 weight percent of 1,3-cyclodiene compound having from 5 to 20 carbon atoms selected from the group consisting of 1,3-cyclohexadiene and substituted derivatives thereof represented by the formula



and 1,3-cyclopentadiene and substituted derivatives thereof represented by the formula



wherein each of the above formulas each R is individually selected from the group consisting of hydrogen, methyl and ethyl, and each R′ is individually selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 5 to 6 carbon atoms, phenyl and methylcyclopentyl, and

(2) from 90 to 10 weight percent of at least one monomer selected from the group consisting of acyclic conjugated dienes having from 4 to 8 carbon atoms per molecule, vinyl-substituted aromatic compounds having from 8 to 14 carbon atoms per molecule, and mixtures thereof in which the weight ratio of said acyclic conjugated diene to said vinyl aromatic compound is in the approximate range of 99:1 to 1:99.

4,179,481

VINYL CHLORIDE RESIN COMPOSITIONS

Minoru Tuzuki; Kuniyoshi Matuba, both of Kobe, and Kazuo Saito, Nishinomiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 641,506, Dec. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 428,814, Dec. 27, 1973, abandoned, which is a continuation of Ser. No. 235,400, Mar. 16, 1972, abandoned. This application Nov. 7, 1977, Ser. No. 849,538

Int. Cl.[2] C08L *53/00*

U.S. Cl. 525—80 **5 Claims**

1. Vinyl chloride resin composition having improved physical properties and improved workability, comprising

(A) 100 parts by weight of vinyl chloride series resin selected from the group consisting of polyvinyl chloride, copolymer of at least 80% by weight vinyl chloride with other monomers copolymerizable therewith, and after chlorinated polyvinyl chloride; and blended therewith

(B) 0.1 to 100 parts by weight of a composite interpolymer having a specific viscosity of at least 0.1, obtained by emulsion polymerizing in an aqueous medium consisting essentially of an emulsifier and a polymerization initiator, 70 to 95 parts by weight of a first member selected fromm the group consisting of methyl methacrylate and a first monomer mixture consisting of 85.71 weight percent or more of methyl methacrylate and 14.29 weight percent or less of a second member selected from the group consisting of n-butyl methacrylate, ethyl methacrylate, ethyl acrylate, acrylonitrile and mixtures thereof; and then, emulsion polymerizing by adding to said aqueous medium containing the polymerization product of the prior polymerization step, 5 to 30 parts by weight of a second monomer mixture consisting essentially of 20 to 40 weight percent methyl methacrylate and 80 to 60 weight percent of a third member selected from the group consisting of ethyl acrylate, n-butyl methacrylate, acrylonitrile, ethyl methacrylate, n-butyl acrylate, and mixtures thereof.

4,179,482

2-CHLOROETHYL PHOSPHONATE COMPOSITIONS

Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,668

Int. Cl.[2] C07F *9/40;* **C08J** *9/00*

U.S. Cl. 260—941 **1 Claim**

1. The composition prepared by the step-wise treatment of phosphorus trichloride with ethylene oxide in about stoichiometric proportions and at temperatures of from about −20° C. to about 125° C. followed by treatment of the resulting phosphite ester intermediate with from about 0.4 to about 1.2 moles of acrylic acid per mole of said phosphite ester intermediate in the presence of lower alkyl acrylate ester to substantially reduce the acidity of said composition and at temperatures of from about 20° C. to about 185° C. until substantially all the phosphite ester is converted to phosphonate structures.

4,179,483

2-CHLOROETHYL PHOSPHONATES

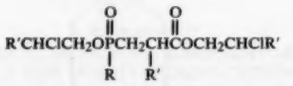
Gail H. Birum, Kirkwood, and Richard F. Jansen, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 855,533, Nov. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 831,707, Sep. 9, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,669

Int. Cl.[2] C07F *9/40;* C08N *5/53*

U.S. Cl. 260—941 3 Claims

1. 2-chloroalkyl (2-chloroalkoxy)hydrocarbylphosphinyl-propionates of the general formula,



where R is phenyl, methyl or ethyl and R′ is hydrogen or methyl.

4,179,484

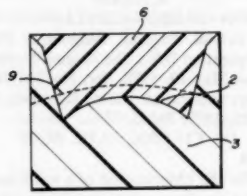
METHOD OF MAKING TORIC LENSES

Charles W. Neefe, Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 874,934, Feb. 3, 1978, Pat. No. 4,150,073, which is a continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,724

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 2 Claims



1. A method of making toric plastic lenses comprising the steps of; providing a positive lens mold having a first spherical surface curvature, and a second surface corresponding to the edge surface of the finished lens with the second surface extending from the first surface curvature a distance greater than the height of the thickness of the lens, forming a negative mold from the positive mold by applying a heat softened resinous material against the first surface curvature and the second surface of the positive mold to form an open top cylinder from the resinous material with an image of the first spherical surface curvature as the bottom of the cylinder and the image of the second surface as the walls of the cylinder, removing the positive lens mold from the negative lens mold, applying sufficient heat to soften the resinous cylinder, applying pressure to two opposing sides of the resinous cylinder to change the shape of the cylinder from a circle to an ellipse and to change the spherical curve present in the bottom of the cylinder from a sphere to toric, allowing the resinous cylinder to cool before removing the pressure, filling the resinous negative mold with a liquid monomer lens material, allowing the liquid monomer lens material to polymerize to form a solid monlithic mass within the resinous negative mold having one finished toric optical surface molded by the toric surface curvature formed in the bottom of the resinous mold, cutting and polishing a second optical surface on the polymerized lens material while the lens material is supported within the resinous mold adjacent to the lens material, and removing the toric lens from the resinous cylinder of the negative mold.

4,179,485

BONE PROSTHESIS AND METHOD OF MANUFACTURE THEREOF

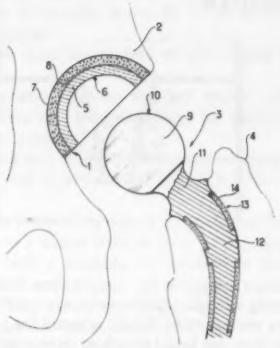
Paul Tritten, Tarbes, France, assignor to Ceraver, France

Continuation-in-part of Ser. No. 739,789, Nov. 8, 1976, abandoned, which is a continuation of Ser. No. 434,685, Jan. 18, 1974, abandoned. This application Jan. 13, 1978, Ser. No. 869,292

Claims priority, application France, Jan. 18, 1973, 73 01668

Int. Cl.[2] C04B *35/10*

U.S. Cl. 264—44 8 Claims



1. A method for manufacturing a bone prosthesis formed at least in part from substantially pure porous alumina and having porosity of about 30% and a pore size of about 100 to 200 microns, comprising granulating a powder of substantially pure alumina with an organic binder into grains of a size between about 0.5 and 1.5 millimeters, heating said grains in bulk to a temperature of at least 1.400° C., but lower than their sintering temperature, disintegrating the bulk so heated, compressing the disintegrated alumina grains at a pressure of at least about 1 metric ton per square centimeter into a first pressed mass, and sintering said first pressed mass at a temperature of about 1.650°–1.700° C. to form said porous alumina.

4,179,486

METHOD OF PROTECTING Si_3N_4 CERAMIC ALLOY DURING HEATING

Frederick F. Lange, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 21, 1978, Ser. No. 926,770

Int. Cl.[2] C04B *35/58, 35/50*

U.S. Cl. 264—65 9 Claims

1. A method of protecting a Si_3N_4 ceramic alloy article during heating comprising the steps of:

providing a Si_3N_4 ceramic alloy article;

loosely packing said article in Si_3N_4 powder;

heating said article and said powder to a processing temperature in an oxidizing atmosphere;

cooling said article and said powder to a temperature below said processing temperature; and

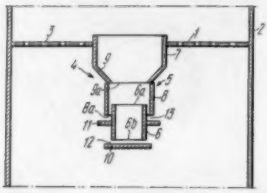
removing said article from said powder.

4,179,487

CONTACT APPARATUS FOR CARRYING OUT HEAT-AND-MASS EXCHANGE PROCESSES

Oleg S. Chekhov, Leninsky prospekt, 152, kv. 77; Alexandr G. Rybinsky, ulitsa Geroev Panfilovtsev, 1, korpus 5, kv. 84, both of Moscow; Anatoly B. Tjutjunnikov, ulitsa Frunze, 17, kv. 34, Kharkov; Gennady P. Solomakha, ulitsa Pervomaiskaya, 56, kv. 25, Moskovskaya oblast, Dolgoprudny, and Viktor V. Dilman, ulitsa Kravchenko, 4, korpus 2, kv. 6, Moscow, all of U.S.S.R.

Filed Apr. 4, 1978, Ser. No. 894,083
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—114 R 8 Claims



1. A contact apparatus for carrying out heat-and-mass processes running in a gas-liquid system, comprising: a perforated base having ports formed therein adapted for gas to pass therethrough; at least one liquid overflow device defining a substantially vertical liquid flow passage including a top shell having a substantially vertically extending axis fixed at its upper region to said perforated base, a bottom shell arranged coaxially with respect to said top shell, said bottom shell having an upper region which partly extends within said top shell a clearance being defined between said bottom shell upper region and said top shell, and top shell being defined by a top shell piece, the upper region thereof comprising said upper region which is fixed to said perforated base, a bottom shell piece having a smaller flow passage area than that of said top shell piece, and a guide member extending between and integrally interconnecting said top and bottom shell pieces, the lower edge of said guide member being situated above the upper end of said bottom shell, a first baffle provided under the lower end of said bottom shell piece, and a second baffle provided under the lower end of said bottom shell whereby liquid is adapted to flow from said perforated base through said overflow device by passing over the upper end of said top shell piece into said top shell whereupon it is directed by said guide member to flow into said bottom shell, the liquid discharging from said overflow device as a substantially flat stream as the same impinges on said second baffle, said clearance defined by said bottom shell upper region and said top shell into which it partly extends being adapted to provide a liquid flow passage for liquid which accumulates within and extends over the upper edge of said lower shell, any liquid passing through said liquid flow passage adapted to impinge on said first baffle.

4,179,488

METHOD OF MAKING A FROSTED BOTTLE OF SATURATED POLYESTER

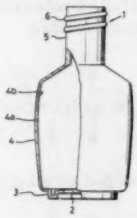
Masanori Nishikawa, Tochigi, and Masao Hattori, Hatano, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 779,473, Mar. 21, 1977. This application Sep. 6, 1977, Ser. No. 830,864
Claims priority, application Japan, Mar. 31, 1976, 51/36636
The portion of the term of this patent subsequent to Aug. 14, 1996, has been disclaimed.
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—521 3 Claims

1. A method of making a frosted bottle of a saturated polyester resin comprising the steps of:

preparing an uncrystallized transparent cylinder of a saturated polyester resin formed by injecting molding and having a bottom wall and upper opening;

heating said cylinder from only the outside thereof at a predetermined temperature above the glass transition temperature for a predetermined time such that, through the thickness, only an outer fraction of the cylinder is crystallized, the interior of the cylinder being at a lower temperature due to the temperature gradient across the thickness of the cylinder such that the interior of the cylinder is maintained to be uncrystallized and transparent;



placing the heated and differentially crystallized cylinder in a mold, and

subsequently blow-molding said cylinder at a temperature suitable for biaxial orientation upon inflation to form said frosted bottle.

4,179,489

CHLORINATION OF IRON-CONTAINING MATERIALS

John Lumsden, Bristol, England, assignor to Mineral Process Licensing Corporation B.V., The Hague, Netherlands

Filed May 19, 1978, Ser. No. 907,766
Claims priority, application United Kingdom, May 19, 1977, 21189/77; Sep. 21, 1977, 39243/77
Int. Cl.[2] C01G *23/02, 49/10*
U.S. Cl. 423—79 16 Claims

1. A process for the chlorination of a solid material containing iron and titanium chemically combined with oxygen, comprising feeding the material to be chlorinated in particulate solid form into a fluidized bed of solids containing ferrous chloride at a temperature between about 200° C. and 677° C., and simultaneously feeding to said fluidized bed at least one chlorinating agent selected from the group consisting of molecular chlorine, sulphur monochloride, and ferric chloride, and a source of sulphur selected from the group consisting of elemental sulphur and sulphur monochloride, the free and combined chlorine and sulphur being present in such molar proportions, relative to the starting material containing iron, titanium, and oxygen, as to produce, as principal reaction products, only solid ferrous chloride, sulphur dioxide gas, and titanium tetrachloride vapor.

4,179,490

PREPARATION OF PURE MAGNESIAN VALUES

George G. Judd, Woodville, Ohio, assignor to Woodville Lime & Chemical Company, Woodville, Ohio

Continuation of Ser. No. 732,528, Oct. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 628,093, Nov. 3, 1975, abandoned. This application Aug. 23, 1978, Ser. No. 936,109
Int. Cl.[2] C01F *5/24*
U.S. Cl. 423—165 2 Claims

1. A method for recovering a magnesium carbonate of very high purity from a composition containing at least one calcium compound and at least one magnesium compound, which method comprises the steps of producing an aqueous slurry consisting of a mixture of precipitated calcium carbonate, precipitated hydrated magnesium carbonate, water insoluble

impurities and water, introducing carbon dioxide into the slurry while maintaining the temperature thereof not higher than about 40° C. until there is an appreciable concentration of magnesium cations in the water of the slurry, discontinuing the carbon dioxide introduction while most of the calcium is present as calcium carbonate, separating solids from the aqueous solution of magnesium cations which results, removing carbon dioxide from the aqueous solution of magnesium cations to precipitate hydrated magnesium carbonate, and separating precipitated hydrated magnesium carbonate from the aqueous phase.

4,179,491

ELECTRICAL DEVICE WITH SEPARATOR AS CONDUCTOR FOR HYDROGEN CATIONS

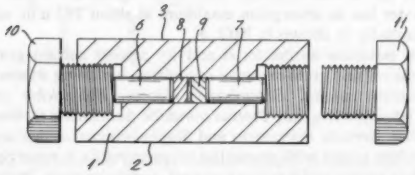
Arthur T. Howe, and Mark G. Shilton, both of Leeds, England, assignors to National Research Development Corporation, London, England

Filed Jan. 20, 1978, Ser. No. 871,003

Claims priority, application United Kingdom, Nov. 15, 1976, 47470/76; May 5, 1977, 18897/77

Int. Cl.[2] C01G *43/00;* **H01M** *8/10, 6/18;* **G01N** *27/46*

U.S. Cl. 423—253 **3 Claims**



1. An electrical device including a separator which is a conductor for hydrogen cations, said conductor comprising the material

$$Y(UO_2)XO_4.nH_2O$$

wherein Y is a cation which is at least partially H cation, the remainder being at least one other cation, and wherein X is phosphorous, arsenic or $I(OH)_2$ and wherein n is at about its equilibrium value, said device further including means for causing said hydrogen cations to pass through said separator.

4,179,492

PROCESS FOR MAKING RARE EARTH METAL CHLORIDES

Paul R. Kruesi, Golden, Colo., assignor to Cato Research Corp., Wheatridge, Colo.

Filed Jul. 8, 1977, Ser. No. 813,884

Int. Cl.[2] C01F *17/00*

U.S. Cl. 423—263 **14 Claims**

1. A process for chlorinating a rare earth metal oxide to its chloride consisting essentially of:

(a) forming a liquid fused salt bath having a lower melting temperature than that of said chloride and wherein said liquid fused salt bath comprises ferric chloride and at least one other metal chloride selected from the group consisting of alkali metal chlorides, alkaline earth metal chlorides, zinc chloride, and ammonium chloride, which bath dissolves the rare earth metal chloride to be formed;

(b) introducing said rare earth metal oxide into said liquid fused bath having a temperature of from about 150° C. to about 550° C. to form said rare earth metal chloride; and

(c) recovering the formed rare earth metal chloride from the fused bath mixture.

4,179,493

DEHYDRATION PROCESS

Abraham Sadan, 1618 E. St. Charles Pl., Salt Lake City, Utah 84121

Filed Feb. 24, 1978, Ser. No. 880,868

Claims priority, application Israel, Mar. 18, 1977, 51692

Int. Cl.[2] B01D *1/00;* **C01B** *15/12;* **C01D** *15/06, 17/00*

U.S. Cl. 423—279 **6 Claims**

1. A process for the partial or complete dehydration of hydrated forms of salts having an increasing solubility with an increase of temperature, and possessing a transition temperature from an existing highly hydrated form to a less hydrated form in the range of between about 30° C. to about 100° C., comprising the steps of:

(a) preparing an aqueous solution of said highly hydrated form of salts;

(b) introducing said aqueous solution into a solar pond which is maintained non-convecting by means of a salt concentration gradient;

(c) concentrating said aqueous solution in an upper layer of the pond to form crystals of said highly hydrated form of the salt;

(d) allowing said formed crystals of the hydrated form of the salt to settle to a hotter bottom layer of the pond and to recrystallize into a partially or completely dehydrated form of the salt; and

(e) recovering the partially or completely dehydrated form of the salt from the bottom layer of the pond.

4,179,494

PROCESS FOR THE PRODUCTION OF CARBON BLACK

Lothar Rothbühr, Hermulheim, and Manfred Voll, Hanau, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 25, 1976, Ser. No. 699,973

Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2530371

Int. Cl.[2] C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—456 **1 Claim**

1. A process for the production of furnace black comprising thermally splitting a carbon black forming oil by introducing air tangentially into a combustion chamber oxidizing with this air a fuel gas in the combustion chamber and thereby producing a stream of hot combustion gases, introducing this stream stepwise into a mixing chamber constricted compared to the combustion chamber, spraying the carbon black forming material into the mixing chamber at a spraying angle between 45° and 180°, conveying the resultant mixture into a reaction chamber enlarged compared to the mixing chamber, quenching the carbon black containing reaction mixture formed and recovering the carbon black, the fuel gas being introduced radially from a point near the axis of the combustion chamber outwardly, said stream of hot combustion gases either (1) being introduced into the mixing chamber via a annular channel or (2) being introduced into an annular channel shaped mixing chamber, the axial velocity of the hot combustion gases at the entrance of the annular channel or mixing chamber being between 600 and 850 meters/sec., the carbon black forming material being sprayed into said mixing chamber or annular channel from a position within said mixing chamber or annular channel to a position outwardly from said within position.

4,179,495

METHOD FOR REMOVING AS, OR AS AND SB AND/OR BI FROM SULFURIC ACID

Seiichi Murakita; Akio Ohta, and Satoshi Narahara, all of Niihama, Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Aug. 22, 1978, Ser. No. 935,860
Claims priority, application Japan, Aug. 25, 1977, 52/102380
Int. Cl.[2] C01B *17/90;* C25C *1/12*
U.S. Cl. 423—531 44 Claims

34. A method for reducing the concentration of As, Sb and Bi in acidic solutions of sulfuric acid comprising providing an acidic solution of sulfuric acid having a free sulfuric acid concentration of less than 700 g./l. and containing arsenic, antimony and bismuth as impurities, warming the acidic solution to above 50° C., adding and mixing to the solution an additive selected from the group consisting of Sb_2O_3, Bi_2O_3 and mixtures thereof, allowing the solution to react with the additive for a time sufficient to cause some of each of the contained impurities to precipitate so that the concentration of arsenic, antimony and bismuth in the solution is less than the initial concentration of arsenic, antimony and bismuth in the solution, and separating the produced precipitate from the solution.

4,179,496

FIBROUS CRYSTALLINE POTASSIUM TITANATE AND PROCESSES FOR PREPARING FIBROUS POTASSIUM TITANATES

Hiroaki Yanagida, Kashiwashi; Tadao Shimizu, Tachikawashi, and Yasuo Nishikawa, Okayamashi, all of Japan, assignors to Kyushu Refractories Co., Ltd., Japan

Filed Aug. 22, 1977, Ser. No. 826,534
Claims priority, application Japan, Aug. 23, 1976, 51-100453; May 6, 1977, 52-51815
Int. Cl.[2] C01G *23/00*
U.S. Cl. 423—598 3 Claims

1. A process for preparing fibrous potassium titanate hydrate comprising kneading a mixture of one or more potassium compounds selected from the group consisting of potassium carbonate, potassium hydroxide, potassium sulfate, potassium nitrate, and potassium chloride, and one or more titanium compounds selected from the group consisting of titanium dioxide and titanium hydroxide with a ratio of potassium atom to titanium atom of between 2:2.5 to 2:8, forming the thus kneaded mixture into lumps or pellets, calcining the lumps or pellets at a temperature of from about 950° C. to 1150° C., recovering the bulk of the pellets after removing the whiskers produced on the surface thereof and then treating the thus recovered bulk in water for at least 30 minutes to form fibrous crystalline potassium titanate hydrate of the formula $2K_2O.1\text{-}1TiO_2.2HO_2$.

2. Fibrous crystalline potassium titanate of the formula $2K_2O.11T.O_2.2H_2O$ prepared by the process of claim 1.

4,179,497

SOLID STATE OPHTHALMIC MEDICATION

Edward M. Cohen, Beaumont, France; Wayne M. Grim, Doylestown, Pa.; Richard J. Harwood, Philadelphia, Pa., and Gunvant N. Mehta, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 553,399, Feb. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,323, Oct. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 425,426, Dec. 17, 1973, abandoned. This application Nov. 13, 1978, Ser. No. 959,550
Int. Cl.[2] A61K *9/22, 9/26*
U.S. Cl. 424—22 1 Claim

1. The method of applying pilocarpine to the eye which comprises inserting a solid ophthalmic insert comprising between 0.1 to about 35% of pilocarpine pamoate as an ophthalmic active agent admixed in a matrix of from about 65 to about 99% of hydroxypropyl cellulose in the cul-de-sac of the conjunctiva to thereby dispense the active agent pilocarpine to the eye over a prolonged period of time.

4,179,498

STREPTOMYCETAL ANTIBIOTIC

Stephen J. Box, Plummers Plain Nr. Horsham, and John D. Hood, Cranleigh, both of England, assignors to Beecham Group Limited, England

Continuation-in-part of Ser. No. 664,917, Mar. 8, 1976, abandoned. This application Aug. 24, 1976, Ser. No. 717,336
Claims priority, application United Kingdom, Mar. 15, 1975, 10914/75
Int. Cl.[2] A61K *25/00*
U.S. Cl. 424—117 9 Claims

1. A pharmaceutically acceptable di-basic salt of MM 17880 which is at least 75% pure wherein MM 17880 is a di-acidic solid of the molecular formula $C_{11\text{-}14}H_{18\text{-}23}O_{8\text{-}11}N_2S_2$ which in the form of a substantially pure di-sodium salt, has the following properties:

(a) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum substantially as shown in FIG. 1;

(b) it has a characteristic nuclear magnetic resonance spectrum which when taken in deuterium oxide is substantially as shown in FIG. 2;

(c) it has a characteristic ultra-violet spectrum which in water has an absorption maximum at about 297 n.m. substantially as shown in FIG. 3;

(d) it possesses antibacterial activity against certain gram-positive and gram-negative organisms, including strains of *Bacillus subtilis, Enterobacter cloacae, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhimurium, Serratia marcescens* and *Staphylococcus aureus;* and

(e) when mixed with ampicillin or amoxycillin it synergizes their antibacterial activity against certain bacteria, including strains of *Staphylococcus aureus* and *Klebsiella aerogenes.*

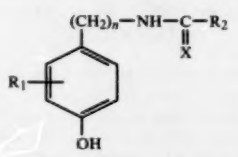
4,179,499

PESTICIDES FOR SNAILS

Kresten Christensen, Brig, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Continuation-in-part of Ser. No. 515,473, Oct. 17, 1974, abandoned, and a continuation-in-part of Ser. No. 515,603, Oct. 17, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,361
Claims priority, application Switzerland, Jul. 5, 1974, 009310/74; Jul. 8, 1974, 009369/74
Int. Cl.[2] A01N *11/04, 9/22, 9/02*
U.S. Cl. 424—143 15 Claims

1. The pesticide composition for snails comprised of an edible binder, a bait substance for snails, a pesticide for snails, a carrier and an amide having the formula:



wherein X is an oxygen atom or a sulfur atom, n is 0 or 1, R_1 is —OH or —OCH_3 and R_2 is (i) an alkyl group having 5 to 11 carbon atoms, (ii) an alkylene group having 5 to 11 carbon atoms, (iii) an alkyl group having 5 to 11 carbon atoms and which is substituted with a phenyl group or with a phenyl group that is substituted with one to three alkyl groups, each such alkyl group having one to five carbon atoms, or (iv) an alkylene group having 5 to 11 carbon atoms and which is substituted with a phenyl group or with a phenyl group that is

substituted with one to three alkyl groups, each such alkyl group having one to five carbon atoms, said amide being present in an amount between 0.005 and 5 percent by weight, based on the total weight of said pesticide composition, and said carrier being present in an amount between 30 and 70 percent by weight, based on the total weight of said pesticide composition.

4,179,500

1,4-DIHYDROPYRIDINE-SUGAR DERIVATIVES, AND THEIR USE AS MEDICAMENTS

Bodo Junge; Friedrich Bossert; Horst Meyer, all of Wuppertal; Egbert Wehinger, Velbert; Wulf Vater, Leverkusen; Arend Heise, Wuppertal; Stanislav Kazda, Wuppertal, and Kurt Stoepel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

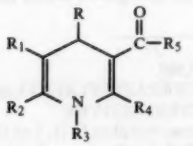
Filed Aug. 26, 1977, Ser. No. 828,135

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641746

Int. Cl.[2] **A61K** *31/70, 31/72;* **C07H** *15/00*

U.S. Cl. 424—180 **13 Claims**

1. A 1,4-Dihydropyridine-sugar derivative of the formula I



I

in which

R represents a phenyl radical which is unsubstituted or carries one or two of the substituents nitro, halogen, trifluoromethyl and cyano, or represents pyridyl, quinolyl or isoquinolyl, the pyridyl radical being unsubstituted or substituted by alkyl with 1 to 4 carbon atoms,

R_1 represents a group of the formula

and $-S(O)_m-R_6$ (m=0 or 2),

wherein

R_6 denotes an alkyl, alkenyl, cycloalkyl or an alkoxyalkyl radical with up to 6 carbon atoms in each case

or wherein

R_6 represents benzyl, phenethyl, phenoxyethyl β-aminoethyl which carries a methyl and a benzyl group on the nitrogen,

R_2 and R_4 identical or different and represent hydrogen, alkyl with 1 to 2 carbon atoms or benzyl,

R_3 represents hydrogen, alkyl with 1 to 4 carbon atoms or benzyl and

R_5 represents a D-glucose, D-fructose, D-mannose, D-galactose, D-ribose, 2-desoxy-D-ribose, D-xylose, D- and L-arabinose, maltose, lactose, saccharose, isomaltose and cellobiose radical, which is bonded to the carbonyl group of the 1,4-dihydropyridine radical either directly or via a short bridge —O—X—, wherein

X represents an alkylene chain of 2 to 4 carbon atoms, the bond to the sugar being via the hydroxyl groups of the sugar unit and being both an ester bond and a glycosidic bond.

11. A method of combating circulatory disease influenced by vasodilation in a warm-blooded animal which comprises administering to said animal an effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,179,501

ANALGESIC N-(2-AMINOCYCLOALIPHATIC)AZIDOBENZAMIDES

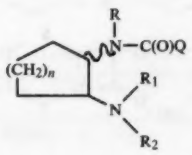
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 741,467, Nov. 12, 1976, Pat. No. 4,098,904. This application May 10, 1978, Ser. No. 904,475

Int. Cl.[2] **A61K** *31/165;* **C07C** *117/00*

U.S. Cl. 424—226 **10 Claims**

1. A compound of the formula



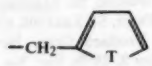
I

wherein

the wavy line (~) at the 1-position of the cycloaliphatic ring denotes trans-stereoconfiguration of the 1-position substituent with respect to the substituent in position 2 of the same cycloaliphatic ring; n is 1 to 8;

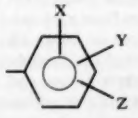
R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are hydrogen, C_1 to C_3-alkyl, or when R_1 is hydrogen or C_1 to C_3-alkyl, R_2 is C_1 to C_6-alkyl, CH_2CF_3, -C_3 to C_6-(allylic)alkenyl, a group of the formula



wherein T is —O— or —S—; C_2 to C_5-hydroxyalkyl, phenyl-C_2 to C_3-alkyl, C_3 to C_6-cycloalkyl, C_3 to C_4-cycloalkylmethyl, or R_1 and R_2, taken together with the nitrogen to which they are bonded, complete an azetidinyl, pyrrolidinyl, piperidinyl, or piperizinyl ring group, or an azetidinyl or pyrrolidinyl ring group substituted in the 3-position with hydroxy, C_1 to C_3-alkyl, C_1 to C_3-alkyloxy, C_1 to C_3-alkanoyloxy, a piperidinyl ring group substituted in the 3- or 4- position with hydroxy, C_1 to C_3-alkyl, C_1 to C_3 alkyloxy, or C_1 to C_3-alkanoyloxy or a piperazinyl ring group substituted on the p-nitrogen thereof with C_1 to C_3-alkyl,

Q is the radical



wherein one of X, Y and Z is azido, and the remaining X, Y and Z moieties are hydrogen, and the pharmaceutically acceptable salts thereof.

5. A composition useful in pharmaceutical dosage unit form in an amount ranging from about 0.5 to about 350 mg. per dosage unit for alleviating pain in warm blooded animals which comprises a compound of Formula I of claim **1** in combination with a pharmaceutically acceptable carrier.

4,179,502

7[2-HYDROXYIMINOACETAMIDO]CEPHALOSPORINS

Mitsuo Numata, 25-13, Ankojicho 4-chome, Takatsuki, Osaka, Japan ((569)); Isao Minamida, 526-13, Oharano-kamisatominaminocho, Nishikyo-ku, Kyoto, Japan ((615)), and Susumu Tsushima, A1-1201, 8 Momoyamadai 2-chome, Suita, Osaka, Japan ((565))

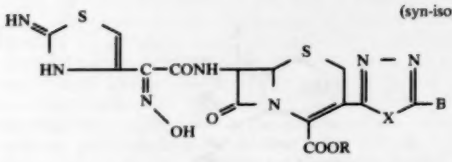
Filed Feb. 14, 1978, Ser. No. 877,746

Claims priority, application Japan, Feb. 17, 1977, 52/16994

Int. Cl.[2] A61K *31/545;* **C07D** *501/20*

U.S. Cl. 424—246 **5 Claims**

1. A 2-hydroxyiminoacetamide of the formula:



(syn-isomer)

wherein X is S; B is —NHCOCH$_3$, and R is hydrogen and pharmaceutically acceptable salts thereof.

4. A method for the treatment of diseases caused by bacteria, which comprises internally administering to a human a pharmaceutically effective amount of the compound as claimed in claim **1**.

5. An antibacterial composition, which comprises a therapeutically effective amount of the compound as claimed in claim **1** and a pharmaceutically acceptable carrier thereof.

4,179,503

1-HYDROXYALKANAMINE PYRANO[3,4-b]INDOLE DERIVATIVES

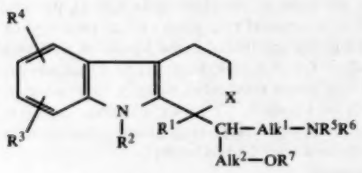
Andre A. Asselin, St. Laurent; Leslie G. Humber, Dollard des Ormeaux; Gervais Dionne, St. Laurent; Clara Revesz, Montreal, and Amedeo Failli, St. Laurent, all of Canada, assignors to American Home Products Corp., New York, N.Y.

Filed May 8, 1978, Ser. No. 904,081

Int. Cl.[2] C07D *491/04, 495/04;* **A61K** *31/40*

U.S. Cl. 424—248.51 **49 Claims**

1. A compound of formula I



(I)

in which R^1 is lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 each independently is hydrogen, lower alkyl, halo, nitro, trifluoromethyl or lower alkoxy; R^5 and R^6 each independently is hydrogen or lower alkyl or R^5 and R^6 together with the nitrogen atom form a pyrrol-1-yl, piperidino or morpholino; R^7 is hydrogen or lower alkyl; Alk^1 and Alk^2 each independently is a straight or branched chain lower alkylene having one to six carbon atoms; and X is oxa or thia, or a therapeutically acceptable acid addition salt thereof.

40. A method of increasing the excretion of urine in a mammal which comprises administering to said mammal an effective diuretic amount of a compound of formula I or a therapeutically acceptable salt thereof, as claimed in claim **1**.

48. A pharmaceutical composition comprising a diuretic effective amount of a compound of formula I or a therpeutically acceptable acid addition salt thereof, as claimed in claim **1**, in combination with a non-mineralocorticoid antagonizing diuretic agent and a pharmaceutically acceptable carrier.

4,179,504

ALKYL AMINE OXIDE TOXICANTS

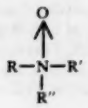
Donald M. Lynch, Waldwick; Myron J. Lover, Mountainside; Arnold J. Singer, South Orange, and William E. Rhodes, III, Cranford, all of N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.

Filed Oct. 14, 1977, Ser. No. 842,057

Int. Cl.[2] A61K *31/535*

U.S. Cl. 424—248.4 **8 Claims**

1. A method of controlling lice, mites or their ova which comprises applying to a human or an animal in need of such control, an effective toxic amount of at least one alkyl amine oxide wherein said oxide is of the formula



wherein R is alkyl, alkenyl or alkylaminoalkyl of 8 to 20 carbon atoms and R′ and R″ are individually selected from the group consisting of lower alkyl and hydroxy lower alkyl, or are linked so as to form with the nitrogen to which they are attached a morpholine group.

4,179,505

5-[4-(DIARYLMETHYL)-1-PIPERAZINYLALKYL]BENZIMIDAZOLE DERIVATIVES

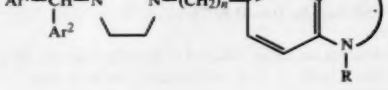
Alfons H. M. Raeymaekers, Beerse; Josephus L. H. Van Gelder, Tielen; Gustaaf M. Boeckx, Oud-Turnhout, and Lodewijk L. Van Hemeldonck, Rijkevorsel, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 782,651, Mar. 30, 1977, abandoned. This application Jan. 4, 1978, Ser. No. 866,882

Int. Cl.[2] A61K *31/495;* **C07D** *401/14, 403/06, 409/14*

U.S. Cl. 424—250 **39 Claims**

1. A chemical compound selected from the group consisting of a 5-[4-(diarylmethyl)-1-piperazinylalkyl]benzimidazole derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, halophenyl, (lower alkyl)phenyl, (lower alkyloxy)phenyl, nitrophenyl, thienyl and pyridinyl;

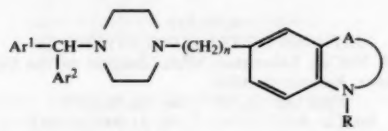
R is a member selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy(lower alkyl), cycloalkyl having from 3 to 6 carbons, (lower alkyl)carbonyloxy(lower alkyl), aroyloxy(lower alkyl), (lower alkyl)sulfonyloxy(lower alkyl), halo(lower alkyl), arylthio(lower alkyl) and (lower alkyl)oxy(lower alkyl) wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, said substituted phenyl being phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, and lower alkyloxy;

A is a member selected from the group consisting of the bivalent radicals —NH—CO— and —N=C(R^1)—, said bivalent radicals being attached to the benzene nucleus with their nitrogen atom, and, said R^1 being selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy(lower alkyl), cycloalkyl having from 3 to

6 carbons, aryl, amino, (lower alkyl)carbonylamino, (lower alkyl)carbonyloxy(lower alkyl), aroyloxy(lower alkyl), (lower alkyl)oxycarbonylamino, (lower alkyl-)aminocarbonylamino, and (lower alkyl)oxycarbonyl(-lower alkyl), wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, pyridinyl, furanyl, thienyl and halothienyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

n is an integer of from 1 to 2 inclusive, provided that when said n is 2 then said R is selected from the group consisting of hydrogen, lower alkyl and cycloalkyl, and then said R^1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and aryl.

27. A method of inhibiting vasoactive agonist activity in warm-blooded animals which comprises the systemic administration thereto of a pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective antihistaminic, anti-allergic or anti-asthmatic amount of a chemical compound selected from the group consisting of a 5-[4-(diarylmethyl)-1-piperazinylalkyl]-benzimidazole derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, halophenyl, (lower alkyl)phenyl, (lower alkyloxy)phenyl, nitrophenyl, thienyl and pyridinyl;

R is a member selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy(lower alkyl), cycloalkyl having from 3 to 6 carbons, (lower alkyl)carbonyloxy(lowr alkyl), aroyloxy(lower alkyl), (lower alkyl)sulfonyloxy(lower alkyl), halo(lower alkyl), arylthio(-lower alkyl) and (lower alkyl)oxy(lower alkyl) wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, said substituted phenyl being phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, and lower alkyloxy;

A is a member selected from the group consisting of the bivalent radicals —NH—CO— and —N=C(R^1)—, said bivalent radicals being attached to the benzene nucleus with their nitrogen atom, and, said R^1 being selected from the group consisting of hydrogen, lower alkyl, aryl(lower alkyl), hydroxy (lower alkyl), cycloalkyl having from 3 to 6 carbons, aryl, amino, (lower alkyl)carbonylamino, (lower alkyl)carbonyloxy(lower alkyl), aroyloxy(lower alkyl), (lower alkyl)oxycarbonylamino, (lower alkyl-)aminocarbonylamino, and (lower alkyl)oxycarbonyl(-lower alkyl), wherein said aryl is selected from the group consisting of phenyl, substituted phenyl, pyridinyl, furanyl, thienyl and halothienyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl and lower alkyloxy;

n is an integer of from 1 to 2 inclusive, provided that when said n is 2 then said R is selected from the group consisting of hydrogen, lower alkyl and cycloalkyl, and then said R^1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and aryl.

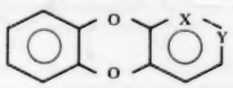
4,179,506

NEW PYRIDOBENZODIOXIN COMPOUNDS AND METHODS FOR THEIR PRODUCTION

Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1978, Ser. No. 960,252
Int. Cl.[2] **A61K** *31/535;* **C07D** *491/04*
U.S. Cl. 424—256 **10 Claims**

1. A compound of the formula



where X is N or N→O and Y is CH or X is CH and Y is N or N→O and pharmaceutically-acceptable acid addition salts of compounds where X is N or Y is N.

6. A pharmaceutical composition comprising a compound of claim **1** and a pharmaceutical carrier.

4,179,507

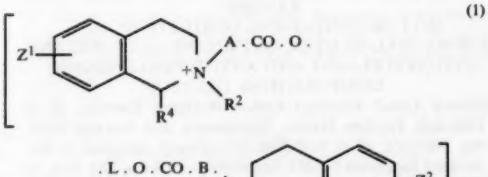
QUARTERNARY AMMONIUM COMPOUNDS

John B. Stenlake, Glasgow, Scotland; Roger D. Waigh, Wilmslow, England; George H. Dewar, Bath, England; John Urwin, South Shields, England, and Nirmal C. Dhar, Glasgow, Scotland, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 9, 1976, Ser. No. 749,174
Claims priority, application United Kingdom, Dec. 10, 1975, 50589/75; Oct. 29, 1976, 45028/76
Int. Cl.[2] **A61K** *31/47;* **C07D2** *17/10*
U.S. Cl. 424—258 **43 Claims**

1. A compound of formula

(1)



wherein

Z^1 and Z^2 are the same or different and each represents a methylenedioxy substituent, or up to three methoxy substituents:

R^2 and R^3 are the same or different and each is alkyl having 1–3 carbon atoms, prop-2-enyl or prop-2-ynyl;

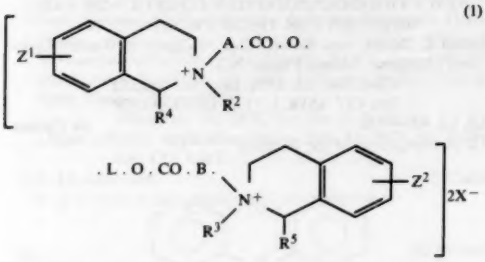
R^4 and R^5 are the same or different and each is a benzyl or phenethyl group wherein the phenyl ring is unsubstituted or is substituted by one or more of halogen, alkoxy having 1 to 3 carbon atoms and methylenedioxy;

A and B are the same or different and each is an alkylene radical containing 1, 2 or 3 carbon atoms;

L is an alkylene chain having from 2 to 12 carbon atoms or is a group—$L^1.0.L^2$—wherein each of L^1 and L^2 is alkylene having at least two carbon atoms and taken together L^1 and L^2 have upto 11 carbon atoms; and

X^- is an anion.

16. A pharmaceutical composition comprising a compound of formula (I)



(I)

in amount sufficient to effect neuromuscular paralysis wherein

Z^1 and Z^2 are the same or different and each represents a methylenedioxy substituent, or up to three methoxy substituents;

R^2 and R^3 are the same or different and each is alkyl having 1–3 carbon atoms, prop-2-enyl or prop-2-ynyl;

R^4 and R^5 are the same or different and each is a benzyl or phenethyl group wherein the phenyl ring is optionally substituted by one or more of halogen, alkoxy having 1 to 3 carbon atoms and methylenedioxy;

A and B are the same or different and each is an alkylene radical containing 1, 2 or 3 carbon atoms;

L is an alkylene chain having from 2 to 12 carbon atoms or is a group—$L^1.O.L^2$—wherein each of L^1 and L^2 is alkylene having at least two carbon atoms and taken together L^1 and L^2 have upto 11 carbon atoms; and

X^- is a pharmaceutically acceptable anion;

in association with a pharmaceutically acceptable carrier.

4,179,508

SULFUR-CONTAINING DERIVATIVES OF 4,4-DIMETHYL-2H,4H-ISOQUINOLINE-1,3-DIONE, AND ANTICONVULSANT AND ANTIHYPERLIPIDEMIC COMPOSITIONS THEREOF

Volkhard Austel; Eberhard Kutter; Wolfgang Eberlein, all of Biberach; Joachim Heider, Warthausen, and Joachim Kähling, Biberach, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

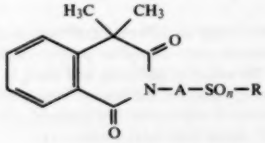
Filed Jul. 18, 1978, Ser. No. 925,877

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734222

Int. Cl.[2] **C07D** *217/24;* **A61K** *31/47*

U.S. Cl. 424—258 **9 Claims**

1. A compound of the formula



where

A is lower alkylene,

R is a lower alkyl, and

n is 0, 1 or 2.

8. An anticonvulsant or antihyperlipidemic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anticonvulsant or antihyperlipidemic amount of a compound of claim **1**.

4,179,509

(SUBSTITUTED 2-CARBOXYANILINO)NICOTINIC ACIDS AS INHIBITORS OF ALLERGIC REACTIONS

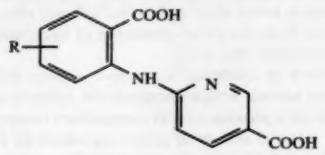
Charles F. Schwender, Dexter, Mich., and Brooks R. Sunday, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 18, 1978, Ser. No. 943,504

Int. Cl.[2] **A61K** *31/455;* **C07D** *213/80*

U.S. Cl. 424—266 **5 Claims**

1. A method of inhibiting an allergic reaction in a mammal which comprises administering a compound of the formula:



wherein R is selected from the group consisting of hydrogen, or lower alkyl or alkoxy of 1 to 4 carbon atoms and the pharmaceutical salts thereof to a mammal in an amount sufficient to inhibit an allergic reaction.

4,179,510

METHODS OF TREATING PSYCHOSIS

John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

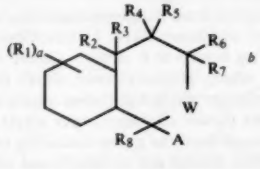
Filed Oct. 31, 1977, Ser. No. 847,371

Int. Cl.[2] **A61U** *31/40, 31/44, 31/445, 31/495*

U.S. Cl. 424—267 **16 Claims**

1. A method of treating psychosis in humans which comprises administering systemically to a psychotic human an antipsychotic dose of a compound selected from the group consisting of compounds having the formula:

I



wherein

R_1 is the same or different and is selected from the group consisting of alkyl of one through three carbons, inclusive, alkoxy and one through three;

a is one through three;

b is zero or one;

R_2 through R_7 are the same or different and are selected from the group consisting of hydrogen, alkyl of one through three carbons, inclusive, hydroxy, alkoxy of one through three carbons; phenyl; halo; cycloalkyl of three through six carbons when R_2 and R_3, R_4 and R_5, or R_6 and R_7 are taken together with the carbon to which they are attached; cycloalkyl of four through seven carbons when R_2 and R_4 or R_4 and R_6 are taken together with the carbons to which they are attached; and cycloalkyl of five or six carbons, with the overall provisos that no more than one ring may be attached to any one carbon and that at least two of R_2 through R_7 are hydrogen.

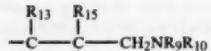
R_8 is alkyl of one through three carbons, hydrogen, or phenyl unsubstituted or substituted with a maximum of three substituents selected from the group consisting of alkyl of one through three carbons, halo, alkoxy of one through three carbons, and trihaloalkyl of one to two carbons;

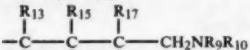
W is oxygen;

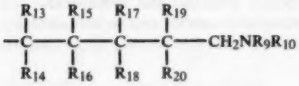
and A is selected from the group consisting of:

(i) $-(CH_2)nNR_9R_{10}$, wherein n is one to five with the proviso that when b is zero, and n is one or two, R_2 through R_5 cannot all be hydrogen at the same time;

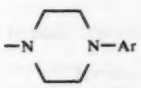
(ii) $-(CH_2)m-(OCH_2CH_2)q-NR_{21}R_{22}$, wherein m and q are each one to three, and R_{21} and R_{22} can be the same or different and are selected from the group consisting of H, alkyl of one through four carbons, and together with the N to which they are attached form heterocyclic rings of four to six ring atoms, morpholine, and NR_9R_{10},

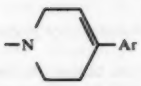

(iii)

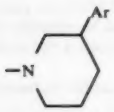

(iv)


(v)

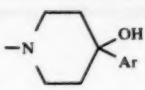
wherein NR_9R_{10} is a heterocyclic amine selected from the group consisting of

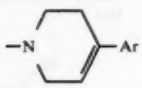


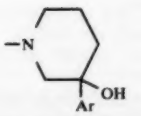




and







R_{13} through R_{20} may be the same or different and are selected from the group hydrogen and alkyl of from 1 or 2 carbon atoms, inclusive;

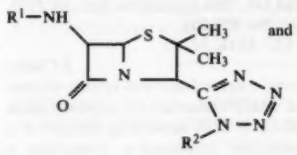
Ar is phenyl unsubstituted or substituted with one through three substituents selected from the group consisting of alkyl or alkoxy of one through three carbons, hydroxy, halo, and trihaloalkyl or trihaloalkoxy of one or two carbons and pharmaceutically acceptable acid addition salts thereof.

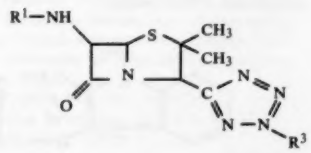
4,179,511
ANTIBACTERIAL 3-(5-TETRAZOLYL) PENAM COMPOUNDS

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 786,817, Apr. 12, 1977, Pat. No. 4,143,039, which is a continuation-in-part of Ser. No. 561,147, Mar. 24, 1975, which is a continuation-in-part of Ser. No. 491,510, Jul. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 450,435, Mar. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Nov. 1, 1978, Ser. No. 957,197
Int. Cl.[2] A61K *31/43*
U.S. Cl. 424—271 9 Claims

1. A method of treating bacterial infections in a mammal which comprises administering to said mammal an antibacterial effective amount of a compound having antibacterial activity and selected from the group consisting of


and



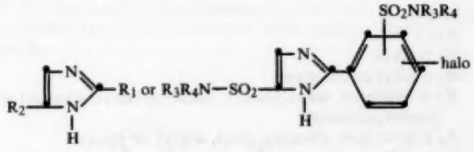
and the pharmaceutically acceptable salts thereof wherein R^1 is an acyl group of an organic carboxylic acid or the acyl group of an acyl derivative selected from the group consisting of esters, amides and chlorides of organic carboxylic acids and R^2 and R^3 are each selected from the group consisting of hydrogen, alkanoyloxymethyl having from 3 to 8 carbon atoms, 1-(alkanoyloxy)ethyl having from 4 to 9 carbon atoms and 3-phthalidyl.

4,179,512
4-SUBSTITUTED-2-ARYLIMIDAZOLES

John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 773,248, Mar. 1, 1977, Pat. No. 4,110,456.
This application May 26, 1978, Ser. No. 910,151
Int. Cl.[2] A61K *31/415*; C07D *233/84*
U.S. Cl. 424—273 R 15 Claims

1. A compound having the formula


I IA

wherein

R_1 is selected from the group consisting of mono chloro, bromo, iodo or fluoro- phenyl and dichloro- or dibromophenyl,

halo is chloro, bromo, iodo or fluoro;

R_2 is selected from the group consisting of C_1–C_5alkyl-S—,

C_1–C_5alkyl-SO—, C_1–C_5alkyl-SO_2— and R_3R_4N—SO_2—, and

R_3 and R_4 are independently selected from H, C_1-C_5alkyl and hydroxy substituted C_2–C_5alkyl,

such that when R_1 is 4-chlorophenyl, R_2 is other than C_1–C_5alkyl-SO— or C_1–C_5alkyl-SO_2—.

14. A composition for treating hypertension containing an effective amount of a compound of claim **1** having formula IA and an inert pharmaceutical carrier.

4,179,513

INDOLE-2-CARBOXYLIC ACIDS TO EFFECT CNS DEPRESSANT ACTIVITY

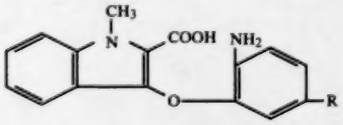
Richard E. Brown, Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 831,629, Sep. 8, 1977, Pat. No. 4,117,129, which is a continuation-in-part of Ser. No. 734,791, Oct. 22, 1976, Pat. No. 4,066,660, which is a division of Ser. No. 620,734, Oct. 8, 1975, Pat. No. 4,013,641. This application Apr. 10, 1978, Ser. No. 895,201

Int. Cl.[2] **A61K** *31/40*

U.S. Cl. 424—274 **3 Claims**

1. A method of producing a central nervous system depressant activity in a mammal which comprises the administration to said mammal of an effective CNS depressing amount of a compound or a pharmaceutical composition comprising a compound of the formula:



wherein R is —H or —Cl or a pharmaceutical acceptable salt thereof.

4,179,514

KETOALKANESULFENYL AND KETOALKANETHIOSULFENYL CARBAMATES

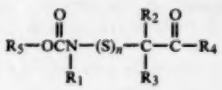
Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 688,410, May 20, 1976, Pat. No. 4,081,550. This application Jan. 6, 1978, Ser. No. 867,368

Int. Cl.[2] **A01N** *9/12*; **C07C** *149/12, 149/20*

U.S. Cl. 424—277 **47 Claims**

1. A compound of the formula:



wherein:

n is 1 or 2;

R_1 is alkyl;

R_2 is alkyl or chlorine;

R_3 is hydrogen, alkyl, phenyl, alkoxycarbonyl, alkanoyl or phenoxycarbonyl;

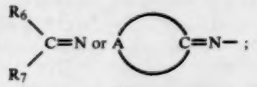
R_4 is hydrogen, phenoxy, alkyl, alkoxy or phenyl;

R_3 and R_4 together may form an alkylene chain completing a five or six membered alicyclic ketone or dione;

R_5 is:

A. naphthyl, benzofuranyl, benzothienyl, indanyl or phenyl; or

B. phenyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkyl, alkynyloxy, alkoxy, dioxalanyl, dialkylamino, alkoxycarbonylamino, dicyanoethylidene, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, dithiolanyl or dialkylaminomethyleneimino groups; or

C. 

R_6 and R_7 are individually hydrogen, cyano, chloro, alkyl, phenyl, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cyanoalkyl, nitroalkyl, cyanoalkylthio alkanoyl or aminocarbonylalkylthio groups; and

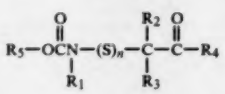
A is a divalent alkylene chain completing a five or six membered alicyclic ring which includes up to three hetero atoms selected from among oxygen, sulfur, sulfinyl, sulfonyl, aminocarbonyl or alkylaminocarbonyl provided that not more than one or said hetero atoms may be aminocarbonyl or alkylaminocarbonyl;

with the proviso that:

A. The total number of aliphatic carbon atoms included in R_1, R_2, R_3, R_4, R_6 and R_7 individually may not exceed six; and

B. At least one R_3 or R_5, substituent includes an oxocarbonyl, heterocyclic function or cyano group.

18. An insecticidal, miticidal and nematocidal composition comprising an acceptable carrier and an insecticidally, miticidally or nematocidally effective amount of a compound of the formula:



wherein:

n is 1 or 2;

R_1 is alkyl;

R_2 is alkyl or chlorine;

R_3 is hydrogen, alkyl, phenyl, alkoxycarbonyl, alkanoyl or phenoxycarbonyl;

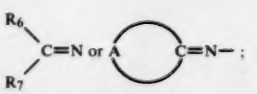
R_4 is hydrogen, phenoxy, alkyl, alkoxy or phenyl;

R_3 and R_4 together may form an alkylene chain completing a five or six membered alicyclic ketone or dione;

R_5 is:

A. naphthyl, benzofuranyl, benzothienyl, indanyl or phenyl; or

B. phenyl substituted with one or more chloro, bromo, fluoro, nitro, cyano, alkyl, alkynyloxy, alkoxy, dioxalanyl, dialkylamino, alkoxycarbonylamino, dicyanoethylidene, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, dithiolanyl or dialkylaminomethyleneimino groups; and

C. 

wherein:

R_6 and R_7 are individually hydrogen, cyano, chloro, alkyl, phenyl, alkylthio, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, cyanoalkyl, nitroalkyl, cyanoalkylthio alkanoyl or aminocarbonylalkylthio groups; and

D. A is a divalent alkylene chain completing a five or six membered alicyclic ring which includes up to three hetero atoms selected from among oxygen, sulfur, sulfinyl, sulfonyl, aminocarbonyl or alkylaminocarbonyl provided that not more than one of said hetero atoms may be aminocarbonyl or alkylaminocarbonyl;

With the proviso that:

A. The total number of aliphatic carbon atoms included in

R_1, R_2, R_3, R_4, R_6 and R_7 substituents individually may not exceed six; and

B. At least one R_3 or R_5, substituent includes an oxocarbonyl group, a heterocyclic group or a cyano group.

31. A composition according to claim **18** wherein the active toxicant is 2-[[0-[N-Methyl-N-(2,4-dimethyl-3-oxo-2-pentanesulfenyl) carbamoyl]oximino]]-1,4-dithiane.

4,179,515

BENZOYLPHENOXY PROPIONIC ACID, ESTERS THEREOF AND PHARMACEUTICAL COMPOSITION

André Mieville, Lausanne, Switzerland, assignor to Orchimed S. A., Switzerland

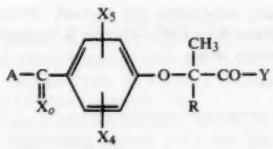
Division of Ser. No. 656,711, Feb. 9, 1976, Pat. No. 4,072,705. This application Oct. 28, 1977, Ser. No. 846,323

Claims priority, application United Kingdom, Feb. 12, 1975, 5979/75; Dec. 10, 1975, 50630/75

Int. Cl.[2] **A61K** *31/335;* **C07C** *69/95*

U.S. Cl. 424—278 **6 Claims**

1. A compound of the formula:



(II)

wherein

A represents 2-methylphenyl, 2,6-dimethylphenyl, 4-ethylphenyl, 4-methoxyphenyl, 3,4,5-trimethoxyphenyl, 4-nitrophenyl, 4-aminophenyl, 4-trifluoromethylphenyl, 3-trifluoromethylphenyl or 4-chloro-3-methoxyphenyl;

R, X_4 and X_5 are the same or different and represent hydrogen or C_{1-4}alkyl;

Y represents OH or C_{1-12}alkoxy; and

X_o represents oxygen if Y is OH or represents oxygen or the —O—CH_2—CH_2—O—group if Y is C_{1-12}alkoxy; or an acid addition thereof.

3. A pharmaceutical composition for the treatment of hyperlipaemia comprising a therapeutically active amount of a compound as claimed in claim **1** or a non-toxic acid-addition salt thereof, and a physiologically acceptable pharmaceutical excipient.

4,179,516

ETHERS OF 3,4-DIHYDRO-1-BENZOXEPIN-5-ONE OXIME TO TREAT INTESTINAL DISORDERS

Germaine Thuillier, Paris; Jacqueline Laforest, Vincennes, and Pierre Bessin, Chilly-Mazarin, all of France, assignors to Albert Rolland, S.A., Paris, France

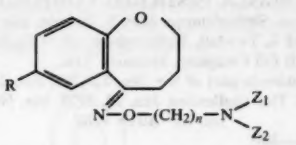
Division of Ser. No. 685,410, May 11, 1976, abandoned, which is a continuation of Ser. No. 492,911, Jul. 29, 1974, abandoned. This application Feb. 14, 1978, Ser. No. 877,616

Claims priority, application France, Jul. 31, 1973, 73 28038; May 22, 1974, 74 17976

Int. Cl.[2] **A61K** *27/00, 31/40, 31/335*

U.S. Cl. 424—278 **3 Claims**

1. A therapeutic composition particularly for treating intestinal disorders comprising a therapeutically effective amount of at least one isomer of the oximino group of the compound having the formula



in which:

R is selected from the group consisting of halogen atoms and lower alkoxy groups;

n is an integer 2 or 3, and

Z_1 and Z_2 are the same or different lower alkyl groups, or NZ_1Z_2 represents a saturated heterocyclic group which may have a second heteroatom selected from the group consisting of N and O,

and the addition salts of the amino group with pharmaceutically acceptable acids,

with a physiological acceptable excipient.

4,179,517

NOVEL TETRAHYDROCANNABINOL TYPE COMPOUNDS

Raphael Mechoulam, Jerusalem; Naphtali Lander, Tel-Aviv; Shabtay Dikstein, and Benyamin Shalita, both of Jerusalem, all of Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

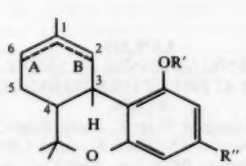
Filed Dec. 28, 1976, Ser. No. 755,083

Claims priority, application Israel, Jan. 12, 1976, 48824

Int. Cl.[2] **A61K** *31/35;* **C07D** *311/02*

U.S. Cl. 424—283 **15 Claims**

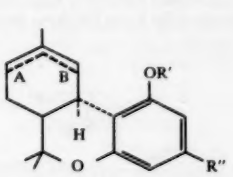
1. A pharmaceutical composition of matter substantially devoid of "cannabis-type" CNS activity, comprising an amount sufficient to effectively treat pain, glaucoma, asthma or stomach or intestinal ulcers of, as active ingredient, a compound of the formula



where A ------B designates a 1(2) or a 6(1) double bond and wherein R′ designates —H or —CO—R where R is lower alkyl, and

R″ designates 1,1-dimethylheptyl or 1,2-dimethylheptyl, and a pharmaceutically acceptable excipient.

9. A compound having pharmaceutical activity but devoid of "cannabis-type" CNS activity of 3S,4S-configuration of the formula



wherein A-----B designates a 1(2) or a 6(1) double bond,

R′ designates —H or —CO—R where R is lower alkyl, and

R″ designates 1,1-dimethyl-heptyl or 1,2-dimethylpeptyl.

4,179,518

SYNERGISTIC PESTICIDAL COMPOSITION

John C. Felton, Sittingbourne; John S. Badmin, Isle of Sheppey, and Roland S. Twydell, Rodmersham, all of England, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 820,269, Jul. 29, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,309

Int. Cl.[2] A01N *9/02*

U.S. Cl. 424—300 **2 Claims**

1. A composition for combating acarid pests comprising

(a) S-methyl N-(methylcarbamoyloxy) thioacetamidate and

(b) an acaridically active α-cyano-3-phenoxybenzyl α-isopropyl-4-chlorophenylacetate on a ratio of (a) to (b) of from about 1 to 1 to about 1 to 5.

4,179,519

METHOD AND COMPOSITION FOR REDUCING SERUM LIPID LEVELS USING P-CHLOROPHENYL P-CHLOROPHENOXYISOBUTYRATE

François Fauran, Castanet Tolosan; Claude Feniou, Pessac; Jacqueline Mosser, St. Medard en Jalles, and Gisèle Prat, Talence, all of France, assignors to Laboratoires Sarget, Merignac, France

Filed Mar. 8, 1978, Ser. No. 884,497

Int. Cl.[2] A61K *31/235*

U.S. Cl. 424—308 **7 Claims**

1. A method of reducing serum lipid levels in humans or animals which comprises administering a hypolipidemically effective amount of p-chlorophenyl 2-(p-chlorophenoxy)-2-methylpropionate.

4. A hypolipidemic composition in unit dosage form, which comprises, per dosage unit, a hypolipidemically effective amount of p-chlorophenyl 2-(p-chlorophenoxy)-2-methylpropionate, as principal active ingredient, in combination with a pharmaceutically acceptable carrier.

4,179,520

L- AND DL-PHENYLGLYCINES TO TREAT A DISEASE OR CONDITION ATTRIBUTABLE TO REDUCED BLOOD FLOW

Ian T. Barnish, Ramsgate; Peter E. Cross; John C. Danilewicz, both of Canterbury, and Malcolm Morville, Cliftonville, all of England, assignors to Pfizer Inc., New York, N.Y.

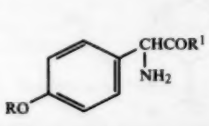
Division of Ser. No. 834,768, Sep. 19, 1977, Pat. No. 4,148,120. This application Aug. 30, 1978, Ser. No. 937,940

Claims priority, application United Kingdom, Sep. 28, 1976, 40306/76

Int. Cl.[2] A61K *31/24*

U.S. Cl. 424—309 **5 Claims**

1. A method of treating a mammalian subject suffering from a disease or condition attributable to reduced blood flow or oxygen availability, which comprises orally or parenterally administering to said subject a blood or flow, oxygen availability increasing amount of the L- or DL-form of a compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or methyl and R^1 is OR^2, wherein R^2 is alkyl having from one to five carbon atoms.

4,179,521

L- AND DL-PHENYLGLYCINES TO TREAT DISEASES OR CONDITIONS ATTRIBUTABLE TO REDUCED CARBOHYDRATE METABOLISM

Ian T. Barnish, Ramsgate; Peter E. Cross; John C. Danilewicz, both of Canterbury, and Malcolm Morville, Cliftonville, all of England, assignors to Pfizer Inc., New York, N.Y.

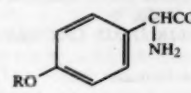
Division of Ser. No. 834,768, Sep. 19, 1977, Pat. No. 4,148,120. This application Aug. 30, 1978, Ser. No. 938,002

Claims priority, application United Kingdom, Sep. 28, 1976, 40306/76

Int. Cl.[2] A61K *31/24*

U.S. Cl. 424—309 **5 Claims**

1. A method of treating a mammalian subject suffering from a disease or condition attributable to reduced carbohydrate metabolism, which comprises orally or parenterally administering to said subject a carbohydrate metabolism increasing amount of the L- or DL- form of a compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or methyl and R^1 is OR^2, wherein R^2 is alkyl having from one to five carbon atoms.

4,179,522

CERTAIN COMPLEX SALTS OF MONO CARBOXYLIC ACIDS USED AS PRESERVATIVES

John J. Huitson, Banstead, England, assignor to BP Chemicals Limited, London, England

Filed Oct. 26, 1976, Ser. No. 735,160

Claims priority, application United Kingdom, Nov. 27, 1975, 48779/75

Int. Cl.[2] A01N *9/00, 9/24*

U.S. Cl. 424—317 **9 Claims**

1. A process for preserving substrates against degradation by microorganisms comprising applying to the said substrate a preservative effective amount of a liquid composition comprising in aqueous solution a complex salt of a cation of ammonium, sodium, potassium, calcium or magnesium and at least one monocarboxylic acid selected from the group consisting of propionic acid, isobutyric acid, and butyric acid, the ratio of acid to cation in the complex salt being in the range of 2:1 and 4:1 on a chemical equivalent basis and the concentration of water in the aqueous solution being between 15% and 75% by weight of the total composition.

4,179,523

CERTAIN CYANODITHIOIMIDOCARBONATES FOR CONTROLLING BACTERIA AND FUNGI

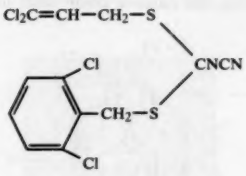
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 863,319, Oct. 2, 1969, Pat. No. 4,124,637. This application Jun. 5, 1978, Ser. No. 912,905

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—324 **2 Claims**

1. The method of controlling bacteria which comprises applying thereto a bactericidally effective amount of a compound of the formula



4,179,524

BIOLOGICALLY ACTIVE AMIDE

Eugene M. Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jun. 16, 1978, Ser. No. 916,276
Int. Cl.[2] A61K *31/165;* C07D *239/64*
U.S. Cl. 424—324 17 Claims

1. Trans-3-fluoro-N-allylcinnamamide

9. The method of treatment on prophylaxis of convulsions in a mammal comprising the administration to the mammal of an anticonvulsant effective non toxic amount of the compound trans-3-fluoro-N-allylcinnamamide.

4,179,525

METHODS FOR FORMING STABLE DISPERSIONS OF GLUTENS WHICH TEND TO AGGLOMERATE

Albert W. Kleinschmidt, Park Forest, Ill., assignor to J. R. Short Milling Company, Chicago, Ill.

Continuation of Ser. No. 705,838, Jul. 16, 1976, abandoned. This application Jun. 15, 1978, Ser. No. 915,583
Int. Cl.[2] A21D *2/36;* A23J *3/00*
U.S. Cl. 426—19 12 Claims

1. The method for producing stable aqueous dispersions of particulate wheat gluten, comprising

providing the gluten in finely particulate form such that the average maximum particle size thereof does not exceed 350 microns;

dispersing the gluten in the aqueous medium; and

also maintaining dispersed in the aqueous medium a finely particulate agglomeration-inhibiting additive which is rich in protein and contains a substantial proportion of native globular protein in at least substantially undenatured form,

said particulate additive being present in an amount equal to at least 3% by weight based on the combined weight of the gluten and said additive but substantially smaller than the amount of gluten and having an average maximum particle dimension not exceeding 350 microns,

particles of said additive interposing between particles of the gluten in the dispersion, and the presence of said globular protein in said additive inhibiting hydrogen bonding between the gluten particles which would otherwise cause the gluten to agglomerate.

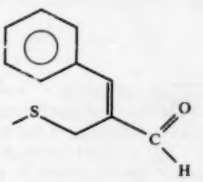
4,179,526

USES OF α-SUBSTITUTED ALKYLIDENE METHIONALS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

Donald A. Withycombe, Lincroft; Anne Hruza, Bricktown; Manfred H. Vock, Locust; Christopher Giacino, Califon; Braja D. Mookherjee, Holmdel; Alan O. Pittet, Atlantic Highlands, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 753,462, Dec. 22, 1976, Pat. No. 4,064,279. This application Aug. 24, 1977, Ser. No. 827,265
The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—535 2 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising adding to said foodstuff from about 0.02 parts per million up to about 50 parts per million based on the total weight of said foodstuff, of 2-[(methylthio)methyl]-3-phenyl-2-propenal having the structure:



said 2-[(methylthio)methyl]-3-phenyl-2-propenal being substantially pure and synthetically produced.

4,179,527

PROCESS FOR MANUFACTURING A WHOLE WHEAT FOOD PRODUCT

E. Gurney White, deceased, late of McAllen, Tex. (by Robert G. Williams, executor), assignor to Nabisco, Inc., East Hanover, N.J.

Filed May 3, 1978, Ser. No. 902,448
Int. Cl.[2] A23L *1/164*
U.S. Cl. 426—620 12 Claims

1. A process for manufacturing a whole wheat food product which comprises:

(a) cooking a mixture of water and whole wheat to provide a cooked whole wheat containing from about 28% to about 55% moisture by weight;

(b) holding the cooked whole wheat for a period of from 0 to about 12 hours under ambient temperature and pressure conditions;

(c) chilling the cooked whole wheat to a temperature of from about 1° C. to about 12° C. to temper the wheat, the temperature selected being such that as the duration of the holding period of step (b) is increased from 0 to about 12 hours, the chilling temperature is proportionately increased from about 1° C. to about 12° C.;

(d) shaping the chilled tempered whole wheat to a desired configuration; and

(e) baking or toasting the shaped, tempered whole wheat food product.

4,179,528

METHOD OF MAKING SILICON DEVICE WITH UNIFORMLY THICK POLYSILICON

David L. Losee, Fairport, and Alvin D. Wilder, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

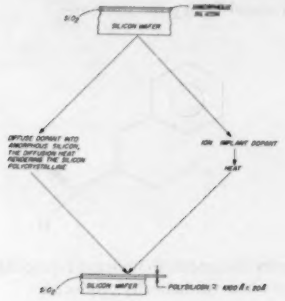
Filed May 18, 1977, Ser. No. 797,971
Int. Cl.[2] H01L *21/363, 21/38*
U.S. Cl. 427—9 7 Claims

1. The process for forming polysilicon of a uniform thickness on a silicon semiconductor device comprising the steps of:

(a) heating monocrystalline silicon in a vacuum to form a vapor of silicon;

(b) exposing the silicon semiconductor device to the silicon

vapor, thereby depositing amorphous silicon on said silicon semiconductor device; and



(c) heating said device to a temperature sufficient to crystallize said amorphous silicon into polycrystalline silicon.

4,179,529

METHOD OF LUBRICATING A THERMOPLASTIC RESIN STRAND FOR SLIDING CONTACT IN A RESHAPING DEVICE

Heinz Vetter, Rossdorf, Fed. Rep. of Germany, assignor to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,903

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2712874

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 427—44 **10 Claims**

1. The method of making a formed strand of thermoplastic synthetic resin having a solidified coating thereon, which method comprises coating an extruded strand of said resin, while in a thermoplastic or thermoelastic condition, with a lubricating layer of a lubricating liquid which can be solidified by heat or radiation, bringing said lubricated synthetic resin strand into sliding contact with a solid surface, whereby form is imparted to said strand, separating the formed strand from said solid surface, and then hardening said layer of lubricating liquid to form a solid coat on said strand.

4,179,530

PROCESS FOR THE DEPOSITION OF PURE SEMICONDUCTOR MATERIAL

Franz Köppl, Altötting; Helmut Hamster, Burghausen; Rudolf Griesshammer, Burghausen, and Helmut Lorenz, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

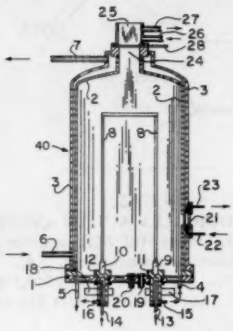
Division of Ser. No. 878,127, Feb. 14, 1978. This application Jan. 12, 1979, Ser. No. 3,060

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722778

Int. Cl.[2] **B05D** *5/12*

U.S. Cl. 427—51 **4 Claims**

1. A process for the deposition of pure semiconductor material, particularly silicon, by thermal decomposition of gaseous compounds of the semiconductor material on thin rods serving as carrier bodies heated to the decomposition temperature of the compounds by the passage of an electrical current comprising: providing an open topped reaction chamber whose interior surfaces are either of silver or silver plated and mounting said electrially heatable carrier rods therein; providing a cover cylinder about the reaction chamber and forming therewith a closed annular chamber; attaching a heating element at said open top and preheating said carrier rods; sealing the open top and removing said heating element; passing a heating current through the carrier rods; passing a coolant through the annular chamber; feeding said gaseous compounds into the reaction



chamber and maintaining an excess pressure of 1–16 bar therein.

4,179,531

POLYTHIOL EFFECT, CURABLE MONOALKENYL AROMATIC-DIENE AND ENE COMPOSITION

Paul R. Hein, and Robert A. Irvin, both of Marietta, Ga., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Aug. 23, 1977, Ser. No. 827,002

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 430—300 **14 Claims**

1. The method of forming a printing plate which comprises exposing to actinic radiation projected through an image-bearing transparency selected portions of a radiation curable composition comprising

(1) at least about 20% by weight of said composition of monoalkenyl aromatic-diene copolymer resin;

(2) at least about 2% by resin weight of at least one monomer substantially compatible with said resin and having at least one photo-cross-linkable C—C-double bond;

(3) about 0.1 to about 35% by resin weight of polythiol containing at least two-SH groups per molecule and

(4) about 0.01 to about 10% by resin weight of photoinitiator.

4,179,532

PROCESS FOR PRODUCING A DISC-SHAPED INFORMATION CARRIER WHICH HAS INFORMATION IN THE FORM OF A BEAM-REFLECTING STRUCTURE

Horst Soeding, Hanover, Fed. Rep. of Germany, assignor to Polygram GmbH, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 784,522, Apr. 4, 1977, Pat. No. 4,126,726. This application Apr. 17, 1978, Ser. No. 897,279

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615605

Int. Cl.[2] **B05D** *3/06*

U.S. Cl. 427—54.1 **8 Claims**

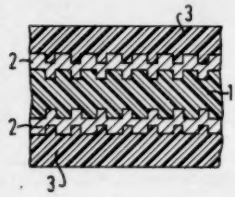
1. A process for producing an information carrier, comprising the steps of:

embossing opposite lacquer portions of a base element with respective surface profiles corresponding to information to be stored;

exposing the embossed lacquer portions to radiant energy to set the profiles;

applying metallic layers over the profiled surfaces while

maintaining the same profile structures on the outer metallic surfaces; and



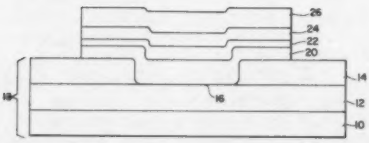
applying transparent protective coatings over the metallic layers.

4,179,533

MULTI-REFRACTORY FILMS FOR GALLIUM ARSENIDE DEVICES

Aristos Christou, Springfield, Va., and Howard M. Day, Hillcrest Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1978, Ser. No. 899,935
Int. Cl.[2] H01L *29/48*
U.S. Cl. 427—84 **7 Claims**



1. A method for constructing systems of sealed refractory layers, in a vacuum, for GaAs semiconductor devices having gold as a conducting electrode, said method requiring no annealing of said systems, comprising the steps of:

forming a refractory layer of a material selected from the group consisting of tantalum, tungsten, and titanium tungsten alloy on a surface of a GaAs substrate for providing a Schottky barrier therebetween, said substrate being maintained at an elevated temperature of approximately 90° C. for said tantalum and said tungsten and approximately 110° C. for said titanium tungsten alloy, said temperatures being sufficient for desorbing interfacial oxides and surface impurities and for providing adhesion between said refractory layer and GaAs;

sealing said refractory layer by depositing a layer of platinum at a substrate temperature in the range of appproximately 90° C. to 175° C. for the tantalum and the tungsten and approximately 90° C. for the titanium tungsten alloy, said temperature being sufficient for doping said refractory layer with the platinum, causing said platinum to migrate to the refractory grain boundaries and seal said boundaries, and preventing grain boundary migration of said GaAs and gold; and

sealing said layer of platinum from said gold by depositing a layer of tantalum at a substrate temperature in the range of approximately 50° C. to 90° C. if said refractory layer is tantalum, or by depositing a layer of tungsten at a substrate temperature in the range of approximately 50° C. to 90° C. if said refractory layer is tungsten, said temperature being sufficient for interdiffusing said tantalum or said tungsten into said platinum and preventing interdiffusion between the platinum and the gold,

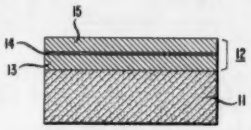
said steps providing controlled heat in the range of about 50° C. to 175° C. to the substrate for individual depositions of said layers and providing thermal stabilization of the Schottky barrier and forming the entire refractory systems within a vacuum and without annealing the refractory systems, said systems forming a barrier layer of tantalum, tungsten, and titanium tungsten alloy doped with platinum at the tantalum, tungsten, and titanium tungsten alloy grain boundaries for preventing migration of said GaAs and gold across said grain boundaries.

4,179,534

GOLD-TIN-GOLD OHMIC CONTACT TO N-TYPE GROUP III–V SEMICONDUCTORS

Chuan C. Chang, Berkeley Heights; Felix Ermanis, Summit; Robert J. McCoy, Chatham; Shohei Nakahara, North Plainfield, and Tan T. Sheng, Millington, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 24, 1978, Ser. No. 909,024
Int. Cl.[2] H01L *23/48*
U.S. Cl. 427—89 **9 Claims**



1. Method for making a semiconductor device comprising making contact to a semiconductor portion at least one micrometer thick, which said portion includes at least 95 mole percent of Group III–V compound semiconductor, which method comprises (a) depositing a contacting layer of metal on the surface of the semiconductor portion and (b) heat treating the semiconductor portion in a nonoxidizing atmosphere CHARACTERIZED IN THAT the depositing includes the sequential deposition of gold, tin and gold, the first gold deposition and the tin deposition taking place while the body is at a temperature of less than 200 degrees C. and the first gold deposition deposits a layer at least 0.1 micrometers thick and the heat treating step includes a residence time of at least one-half minute in the temperature range from 350 degrees C. to 500 degrees C.

4,179,535

METHOD OF FORMING A FIRE-RESISTANT SILICATE COATING

Reinhard Kalbskopf, and Felix Trojer, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Jun. 3, 1977, Ser. No. 803,281
Claims priority, application Switzerland, Jun. 4, 1976, 7100/76
Int. Cl.[2] B05D *3/02, 1/36, 7/00*
U.S. Cl. 427—206 **17 Claims**

1. A method for protecting a substrate from fire damage by coating said substrate with a tumescent material, said method comprising the steps of:

(a) mixing hydrated alkali-metal silicate particles in an aqueous solution of alkali metal silicate to form a suspension of said particles, said particles containing 15 to 20 weight percent of water as water of hydration prior to said mixing step, said aqueous solution containing 40 to 80 weight percent dissolved alkali-metal silicate and 60 to 20 weight percent water prior to said mixing step

(b) applying a layer of said suspension to said substrate to form a coating thereon prior to significant absorption of water from said solution portion of said suspension by said particles.

4,179,536

ANTICORROSIVE PAINTS FOR OIL CONTAINERS

Hiroshi Kasamatsu, 47-7, Higashihon-cho, and Koshiro Suzuki, 52-25, Higashihon-cho, both of Otashi, Gunma-ken, Japan

Continuation of Ser. No. 253,816, May 16, 1972, abandoned, and a continuation-in-part of Ser. No. 73,683, Sep. 18, 1970, abandoned, and Ser. No. 877,850, Nov. 18, 1969, abandoned.
This application Feb. 15, 1974, Ser. No. 442,867
Int. Cl.[2] B05D *1/00;* C09D *5/08, 5/14*
U.S. Cl. 427—239 3 Claims

1. An anti-corrosive paint for oil containers consisting essentially of a tri-n-butyltin compound selected from the group consisting of tri-n-butyltin 4-nitrophenoxy acetate, tri-n-butyltin 4-t-butylphenyl-thio acetate, tri-n-butyltin methoxy acetate, tri-n-butyltin t-butoxy acetate, tri-n-butyltin n-propoxy acetate, tri-n-butyltin ethylthio acetate and tri-n-butyltin 4-t-butylphenyl thioether dissolved, mixed or dispersed in a vehicle comprising synthetic resin and a volatile organic solvent having said resin dissolved therein, said resin being selected from the group consisting of epoxy, and acrylic, resins, the amount of the tin compound being 0.1 to 0.5 part by weight for each 100 parts by weight of whole paint.

4,179,537

SILANE COUPLING AGENTS

John J. Rykowski, 1026 S. Fircroft St., West Covina, Calif. 91791

Filed Jan. 4, 1978, Ser. No. 866,877
Int. Cl.[2] B05D *1/36;* B32D *17/10;* C07F *7/18*
U.S. Cl. 427—387 20 Claims

1. A coating composition for improving adhesion between an organic matrix and an inorganic substrate. which comprises:

from about 5 to 95 weight percent of a component selected from a first group consisting of methacryloxyalkyltrialkoxysilanes, mercaptoalkyltrialkoxysilanes, vinyltrialkoxysilanes, vinyltrihalosilanes, and alkylvinyldihalosilanes wherein each alkyl or alkoxy group has 1 to 3 carbon atoms inclusive, and from about 5 to 95 weight percent of a second component selected from a second group consisting of alkyltrialkoxysilanes, dialkyldialkoxysilanes, trialkylalkoxysilanes, trialkoxysilanes, tetraalkoxysilanes, aryltrialkoxysilanes, alkylaryldialkoxysilanes, and diaryldialkoxysilanes, wherein each aryl group is phenyl, chlorophenyl or or para-tolyl, and each alkyl group has 1 to 8 carbon atoms inclusive, and each alkoxy group has 1 to 3 carbon atoms inclusive.

9. A method for improving adhesion between glass and a polymerizate of an ethylenically unsaturated resin which comprises:

treating glass with a solution of a silane composition, the composition comprising from about 5 to 95 weight percent of a methacryloxyalkyltrialkoxysilane and from about 5 to 95 weight percent of an alkyltrialkoxysilane, each alkyl or alkoxy group having 1 to 3 carbon atoms;

contacting treated glass with an ethylenically unsaturated resin, and

curing the resin to provide a solid material having said glass bonded thereto.

4,179,538

PROCESS OF ELIMINATING CRACKING IN THE COATING OF TiO_2 LAYERS

Herbert R. Sassenhausen, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1977, Ser. No. 831,206
Claims priority, application United Kingdom, Sep. 10, 1976, 37421/76
Int. Cl.[2] B05D *1/34, 1/36;* B32B *27/30, 27/18, 23/04, 9/02*
U.S. Cl. 430—213 11 Claims

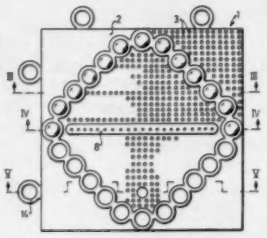
1. In a process of coating a layer comprising a titanium dioxide pigment and a hydroxyethylcellulose binder on a water-absorbent layer carried by a support wherein the ratio of titanium dioxide to hydroxyethylcellulose is such that said titanium dioxide layer has a propensity to crack during said coating, the improvement wherein during said coating of said titanium dioxide layer, a hydrophilic colloid layer is simultaneously coated thereover, thereby eliminating the propensity of said titanium dioxide layer to crack.

4,179,539

SKI SLOPE

Herbert Schweizer, Kirchstrasse 47, D 7024 Filderstadt, IV, Fed. Rep. of Germany

Filed Aug. 16, 1978, Ser. No. 934,117
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737222
Int. Cl.[2] A63G *21/00;* B44F *7/00*
U.S. Cl. 428—58 6 Claims



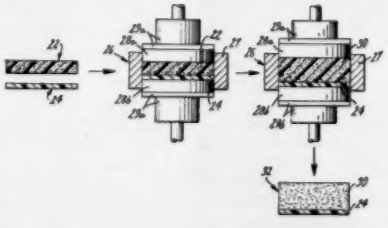
1. A skiing surface comprising a plurality of single elements formed of plastic and adapted to be joined together in a side-by-side relationship, each single element including a base layer, a plurality of glide fingers on the upper surface of said base layer extending perpendicular to said base layer surface, a plurality of sockets in the upper surface of said base layer, a glide ball which extends upwardly from each socket to a height at which the top of the ball is coincident with the height of the glide fingers and is rotatably disposed in each of said sockets, at least one elongated groove in the upper surface of said base layer and a guidance comb which includes a plurality of easily flexible teeth, said teeth extending upwardly from the surface of said base layer to a height greater than the height of the glide fingers, each of the teeth being provided with a spherical thickening on its upper end, said guidance comb mounted in said groove.

4,179,540

FABRICATION OF FOAMED ARTICLES

Walter H. Smarook, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 536,955, Dec. 23, 1974, Pat. No. 4,127,547.
This application Feb. 19, 1976, Ser. No. 659,256
Int. Cl.[2] B29D *27/00*
U.S. Cl. 428—71 61 Claims



1. Method of fabricating low density, foamed articles comprising the steps of:

(a) blending at least one normally solid thermoplastic polymer resin with about 25 to about 80 parts per 100 parts by weight of said resin of a normally liquid organic solvent having a solubility parameter, δ, within about (1.3 calories/cc)$^{\frac{1}{2}}$ of that of said resin or a mixture of normally liquid organic solvents having an average solubility parameter, δ, within about (1.3 calories/cc)$^{\frac{1}{2}}$ of that of said resin;

(b) blending the mixture obtained in step (a) with at least about 1 part by weight, per 100 parts of said resin, of water until a white homogeneous mixture of resin, solvent, and water is obtained whereby a non-tacky hydrogel dough is obtained;

(c) shaping the non-tacky hydrogel dough obtained in step (b);

(d) vaporizing the solvent and water;

(e) removing the solvent and water; and

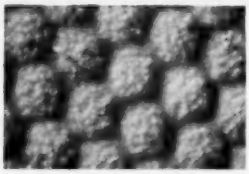
(f) recovering a foamed resin article.

4,179,541

PHOTOGRAPHIC SUPPORT MATERIAL AND METHOD OF PRODUCING SAME

Masao Miyama; Sakan Yamaguti, and You Kusama, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 12, 1977, Ser. No. 824,114
Claims priority, application Japan, Aug. 16, 1976, 51-96947
Int. Cl.[2] B32B *3/30;* **B05D** *5/02;* **B32B** *31/20*
U.S. Cl. 428—165 **12 Claims**



1. A method for producing a photographic support material, which comprises extrusion-coating a polyolefin resin over a pattern embossed on a base paper material and pressing the polyolefin resin coating onto the embossed paper with a cooling roll to form an embossed polyolefin-coated paper, said cooling roll having a surface finish to impart a desired amount of gloss to the embossed surface.

12. A photographic support material produced by the method according to claim 1.

4,179,542

SYNERGISTIC PRIMER FOR FLUOROPOLYMER COATINGS

Alkis Christofas, Levittown, and Julius E. Dohany, Berwyn, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 865,762, Dec. 29, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,108
Int. Cl.[2] B32B *15/08, 15/16, 27/38*
U.S. Cl. 428—324 **29 Claims**

1. A primer coating composition comprising from about 34 to about 70 percent by weight of the solids in said composition of a resin binder consisting of (a) a thermoplastic resin selected from the group consisting of vinylidene fluoride homopolymers and copolymers of at least 40 mole percent of at least one fluorinated aliphatic monomer having a terminal ethylenic bond with at least one different aliphatic monomer having a terminal ethylenic bond, and (b) from about 18 to about 45 percent, based on the weight of said thermoplastic resin, of a heat curable epoxy resin; and, as the remainder of the solids in said composition, a filler pigment consisting of (a) finely-divided mica and (b) from about 20 to about 40 percent, based on the weight of said mica, of metallic pigment powder.

14. A heat cured composite structure comprising (A) a solid base member, (B) a primer coating of a thickness ranging from about 1 to about 10 mils adhering to at least one surface of said base member comprising a mixture of from about 34 to about 70 percent by weight of said mixture of a resin binder consisting of (a) a thermoplastic resin selected from the group consisting of vinylidene fluoride homopolymer and copolymers of at least 40 mole percent of at least one fluorinated aliphatic monomer having a terminal ethylenic bond with at least one different aliphatic monomer having a terminal ethylenic bond, and (b) from about 18 to about 45 percent, based on the weight of said thermoplastic resin, of an epoxy resin, and, as the remainder of said mixture, a filler pigment consisting of (a) finely-divided mica and (b) from about 20 to about 40 percent, based on the weight of said mica, of metallic pigment powder, and (C) a top coating having a thickness of at least about 2 mils adhering to said primer coating, said top coating comprising a thermoplastic resin containing at least 50 mole percent of polymerized monomeric units which are identical to those of the thermoplastic resin of said resin binder.

24. A method of making a composite structure comprising (a) providing a clean, grease free solid substrate, (b) coating the substrate with a liquid dispersion of a primer composition as described in claim 1, (c) drying the primer dispersion at a temperature no greater than about 90° C., (d) topcoating the primer with a coating composition comprising a thermoplastic resin containing at least 50 mole percent of polymerized monomer units identical to those of the resin binder of said primer, and (e) subjecting the topcoating to a fusion temperature above the melting point, but below the decomposition temperature of the top coat resin whereby a pin-hole free surface is produced.

4,179,543

STAPLE FIBER, FINISH THEREFOR AND PROCESS FOR USE OF SAME

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Division of American Hoechst Corporation, Spartanburg, S.C.

Filed Aug. 19, 1976, Ser. No. 715,719
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—361 **5 Claims**

1. A synthetic polymeric textile fiber in staple form in lengths of from about ¼ inches to about 3 inches having a finish thereon consisting essentially of:

(a) an ethoxylated primary emulsifier containing at least five moles of ethylene oxide and having a surface tension of at least 30 dynes per centimeter in a 0.10 weight percent aqueous solution of same at about 25 degrees Centrigrade,

(b) a lubricant for said fiber,

(c) a secondary emulsifier for said lubricant, said secondary emulsifier being compatible with said primary emulsifier, said finish being present on the fiber in an amount of at least 0.1 percent based on fiber weight and exhibiting a low foaming propensity and being conducive to good fiber bondability in the presence of a chemical binder.

4,179,544

FIBER FINISH COMPOSITIONS

David D. Newkirk, Woodhaven; Basil Thir, Wyandotte, and Robert B. Login, Woodhaven, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 5, 1977, Ser. No. 857,382
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—395 **12 Claims**

1. A synthetic polyamide or polyester fiber having deposited thereon a composition consisting essentially of a mixture of (1) a major amount of a polyoxyalkylene ether compound lubricant and (2) a minor effective amount of stabilizer sufficient to

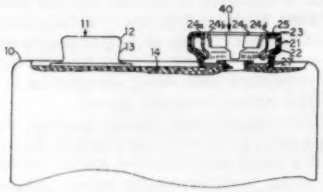
prevent oxidative degradation of said lubricant upon exposure to heat in the presence of oxides of nitrogen, said stabilizer a reaction product of one mole of dicyclopentadiene, at least one mole of p-cresol and at least one-half mole of isobutylene wherein the amount of stabilizer ranges from about 0.05 to about 0.45 weight percent based on the weight of the lubricant.

4,179,545

BATTERY WITH PROTECTIVELY JACKETED FEMALE TERMINAL

Frank L. Ciliberti, Jr., Ossining, N.Y., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed May 25, 1978, Ser. No. 909,337
Int. Cl.[2] H01M 2/30
U.S. Cl. 429—65 **8 Claims**



1. An electric battery having an exposed female terminal protruding from a wall thereof characterized in that said female terminal is jacketed by protective means, with said female terminal substantially supporting said protective means and wherein said protective means permits external electrical connection with said female terminal.

4,179,546

METHOD FOR EXPANDING MICROSPHERES AND EXPANDABLE COMPOSITION

Joseph L. Garner, Sanford, and Peter A. Tiffany, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 284,175, Aug. 28, 1972, abandoned.
This application Sep. 12, 1974, Ser. No. 505,298
Int. Cl.[2] C08J 9/12; B01J 13/02
U.S. Cl. 521—56 **6 Claims**

1. An aqueous mass of expandable synthetic resinous microspheres, the microspheres beng expandable to form a monocellular hollow gas filled polymer cell at a temperature below the boiling point of water, the microspheres having a synthetic resinous thermosplastic shell symmetrically encapsulating therein a single droplet of volatile liquid raising agent, the microspheres being in an aqueous dispersing medium, the aqueous dispersing medium having dissolved therein from about 0.2 to 5 weight percent, based on the weight of the microspheres, of hydrogen peroxide.

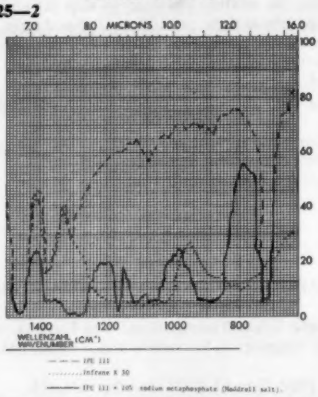
4. A method for the expansion of expandable synthetic resinous microspheres, the microspheres having a synthetic resinous thermoplastic shell symmetrically encapsulating therein a single droplet of a volatile liquid raising agent and on heating being capable of expanding to form a hollow gas filled polymeric monocellular particle, the steps of the method comprising providing a mass of expandable microspheres in an aqueous medium, adding to and dissolving in the aqueous medium from about 0.2 to 5 weight percent, based of the weight of the microspheres, of hydrogen peroxide and subsequently heating the aqueous medium to a temperature below the boiling point of water to cause the microspheres to expand to form monocellular gas filled particles.

4,179,547

POLYETHYLENE SHEETS AND FILMS

Yael Allingham; David Vofsi, and Saul A. Gassner, all of Rehovot, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Jun. 14, 1978, Ser. No. 915,433
Claims priority, application Israel, Jun. 29, 1977, 52412
Int. Cl.[2] C08K 3/32
U.S. Cl. 525—2 **6 Claims**



1. A polymeric composition of matter substantially transparent to solar radiation and constituting an effective barrier to infra-red radiation, especially in the region of about 7 μ to 15 μ, comprising polyethylene or a copolymer of mainly polyethylene, containing an effective quantity of an insoluble metaphosphate.

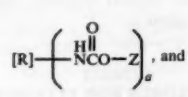
4,179,548

UV CURABLE RESIN COMPOSITIONS CONTAINING URETHANES OF HYDROXYBENZOTRIAZOLES OR URETHANES OF HYDROXY BENZOPHENONES

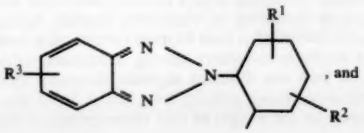
Siegfried H. Schroeter, and Daniel R. Olson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 626,490, Oct. 28, 1975, Pat. No. 4,061,652.
This application Sep. 14, 1977, Ser. No. 833,144
Int. Cl.[2] C08L 33/10, 33/12, 63/02, 67/02
U.S. Cl. 525—329 **4 Claims**

1. A UV curable composition comprising an organic resin, 0.1 to 10% by weight of the UV curable composition of an organic urethane of the formula,



0.01 to 1% by weight of the UV curable composition of a urethane decomposition catalyst, where R is a is a member selected from the group consisting of a $C_{(1-12)}$ aliphatic hydrocarbon radical, a $C_{(6-13)}$ aromatic hydrocarbon radical, and halogenated derivatives thereof, "a" is an integer equal to 1 or 2, and when a is 1, R is monovalent, and when a is 2, R is divalent, Z is an aromatic organic radical having the formula,



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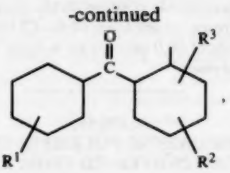


where R^1, R^2, and R^3 can be the same or different monovalent radicals selected from the group consisting of $C_{(1-12)}$ alkyl radicals, $C_{(1-12)}$ alkoxy radicals, halogen and hydrogen.

4,179,549

QUATERNARY AMMONIUM ADDUCTS OF POLYMERIZABLE TERTIARY AMMONIUM SALTS AND ACRYLAMIDE

Rudolf S. Buriks; Allen R. Fauke, and David W. Griffiths, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 14, 1974, Ser. No. 523,813
Int. Cl.[2] C08F *2/32, 18/22, 22/22, 20/70*
U.S. Cl. 525—374 **6 Claims**

1. A polymer which is a terpolymer of the following units:
(1) acrylamide,
(2) dimethylaminoethylmethacrylate, and
(3) the quaternary adduct of dimethylaminoethylmethacrylate and acrylamide; and the anion is chloride or acetate.

4,179,550

METHOD FOR PREPARING A NOVEL POLYMER

Ryoichi Miyamoto, Ohtake, and Minoru Morita, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 25, 1978, Ser. No. 899,966
Claims priority, application Japan, Apr. 26, 1977, 52-47337
Int. Cl.[2] C08F *4/34, 32/08;* **C08G** *59/02*
U.S. Cl. 526—212 **25 Claims**

1. A method for preparing a novel polymer which comprises polymerizing a polymerizable material selected from the group consisting of
(a) substituted or unsubstituted dicyclopentadiene,
(b) cationically polymerizable unsaturated hydrocarbon-containing fraction obtained by distilling a cracking or reforming product of a petroleum and having a boiling point in the range of −20° C. to 280° C.,
(c) a cationically polymerizable vinyl aromatic hydrocarbon having 8 to 10 carbon atoms,
(d) a mixture of two or three of ingredients (a), (b) and (c), and
(e) a mixture of any one of ingredients (a) to (d) with a cationically polymerizable unsaturated aliphatic hydrocarbon having 4 to 8 carbon atoms in the presence of a cationic polymerization catalyst; wherein a high-boiling product having a boiling point of at least about 150° C. and an oyxgen content of at least 0.5% by weight is introduded into the polymerization system at any stage of the polymerization process, or the high-boiling product is reacted with a polymer produced by polymerizing the polymerizable material in the presence of the cationic polymerization catalyst, said high-boiling product being obtained as a residue, comprising a mixture of by-products, in a process comprising oxidizing a benzene or naphthalene ring-substituted with at least one isopropyl group to convert it to the corresponding hydroperoxide, decomposing the hydroperoxide with an acid to produce the corresponding phenol or naphthol, and separating the phenol or naphthol from the resultant reaction mixture to obtain said residue comprising a mixture of said by-products.

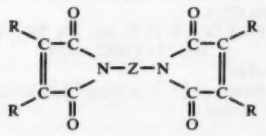
4,179,551

LOW TEMPERATURE CURABLE COMPLIANT BISMALEIMIDE COMPOSITIONS

Robert J. Jones, Hermosa Beach; Howard E. Green, Seal Beach, and Sandra C. Quinlivan, Torrance, all of Calif., assignors to TRW, Inc., Redondo Beach, Calif.

Filed Oct. 25, 1977, Ser. No. 845,058
Int. Cl.[2] C08F *226/06*
U.S. Cl. 526—262 **49 Claims**

1. A low temperature free radical curable composition which comprises:
(a) a curable prepolymer which is a polyimide formed at an elevated temperature sufficient to cause thermal reaction between heated components of a mixture of:
(i) at least one aliphatic bismaleimide of the formula:



wherein Z is a polyaliphatic ether in which each aliphatic ether group individually contains from 1 to about 6 carbon atoms and in which each R is independently selected from the group consisting of hydrogen, an aliphatic group containing 1 or 2 carbon atoms, a benzenoid radical and a halogen; and
(ii) at least one aromatic polyamine; and (b) at least one cross linking agent containing at least two functional vinyl groups.

4,179,552

PROCESS FOR ACCELERATED CURE OF EPOXY RESINS

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,748
Int. Cl.[2] C08G *59/50, 59/60*
U.S. Cl. 528—111 **22 Claims**

1. An epoxy resin composition comprising:
a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule, and
a reaction product of an epoxy resin with an excess of an aminopropyl derivative of a polyoxyalkylenepolyamine.

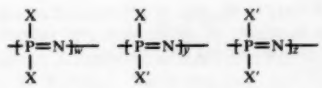
4,179,553

POLYPHOSPHAZENE POLYMERS CONTAINING CYCLIC KETAL SUBSTITUENTS

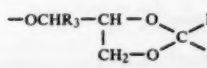
William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,512
Int. Cl.[2] C08G *79/04*
U.S. Cl. 528—168 **11 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is



in which R_1 and R_2 are independently selected from a group consisting of substituted and unsubstituted aliphatic, aryl, arayl, alkylaryl and heterocyclic radicals or R_1 and R_2 can be linked to form a cyclic radical and R_3 is selected from the group consisting of an aliphatic hydrocarbon radical and hydrogen wherein X' is selected from the group consisting of chlorine and a substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radical or mixtures thereof; $20 \leqq (w+y+z) \leqq 50{,}000$ per polymer; and X and X' are independently selected for each unit.

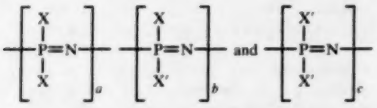
4,179,554

POLYPHOSPHAZENE COPOLYMERS CONTAINING DIALKYL AMINOXY SUBSTITUENTS

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,399
Int. Cl.[2] C08G *79/04*
U.S. Cl. 528—168 **9 Claims**

1. A polyphosphazene copolymer containing units represented by the formulas:



wherein X is —O—NR_2 in which R is alkyl containing from 1 to 8 carbon atoms or cycloalkyl containing from 3 to 12 ring carbon atoms; wherein X' is selected from the group consisting of substituted or unsubstituted alkoxy, aryloxy, amino and mercapto groups and wherein $20 \leqq (a+b+c) \leqq 50{,}000$ per polymer.

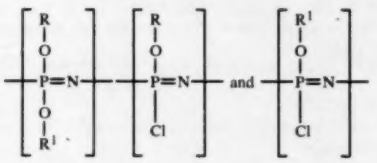
4,179,555

OIL-FREE ELASTOMERIC POLY(ARYLOXYPHOSPHAZENE) COPOLYMERS

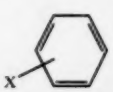
Tai C. Cheng, Akron; John W. Fieldhouse, Mogadore; Arthur E. Oberster, Canton, and Daniel F. Graves, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 28, 1978, Ser. No. 919,888
Int. Cl.[2] C08G *79/02*
U.S. Cl. 528—168 **20 Claims**

1. Oil-free elastomeric poly(aryloxyphosphazene) copolymers consisting essentially of randomly distributed repeating units represented by the formulas:



wherein R and R^1 may be the same or different and are selected from the group consisting of monovalent aryl radicals and substituted aryl radicals having the structure:



wherein X is a substituent selected from the group consisting of alkyl, alkoxy, aryl, aryloxy, amino and halogen substituted on any sterically permissible position on the phenyl group and the amount of Cl present in the form of P—Cl bonds is from about 0.4 percent to about 10.0 percent by weight based on the total weight of copolymer.

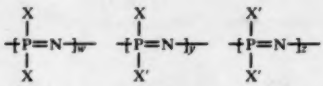
4,179,556

POLYPHOSPHAZENE POLYMERS CONTAINING SUBSTITUENTS DERIVED FROM KETOXIMES

William L. Hergenrother, Akron, and Adel F. Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 3, 1978, Ser. No. 957,513
Int. Cl.[2] C08G *79/04*
U.S. Cl. 528—168 **13 Claims**

1. A polyphosphazene polymer containing units represented by the formulas:



wherein X is —O—N=CR_1R_2 in which R_1 and R_2 are independently selected from a group consisting of substituted and unsubstituted alkyl radicals containing from 1 to 15 carbon atoms substituted and unsubstituted cycloalkyl, aryl, arylalkyl and heterocyclic radicals or R_1 and R_2 taken together form a cyclic ring, wherein X' is selected from the group consisting of chlorine and a substituted and unsubstituted alkoxy, aryloxy, amino and mercapto radical or mixtures thereof; $20 \leqq (w+y+z) \leqq 50{,}000$ per polymer, and X and X' are independently selected for each unit.

4,179,557

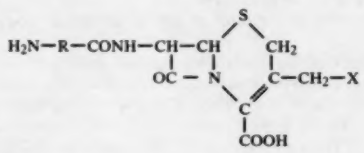
ACYLATION OF 7-AMINOCEPHALOSPORANIC ACIDS

Toshiyasu Ishimaru, Suita; Yasutsugu Shimonishi, Nishinomiya; Hisayuki Sakurai, Osaka, and Minoru Hatanaka, Takatsuki, all of Japan, assignors to President of Osaka University, Japan

Division of Ser. No. 82,814, Oct. 21, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 428,037
Int. Cl.[2] C07D *501/04, 501/06*
U.S. Cl. 544—28 **24 Claims**

1. In a process for producing a member selected from the group consisting of

(a) a 7-aminoacylamidocephalosporanic acid represented by the formula:



(VII)

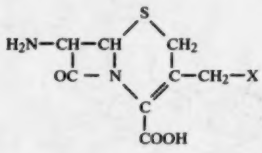
and

(b) a non-toxic salt of said 7-aminoacylamidocephalosporanic acid, wherein R is an alkylene group or

wherein R_5 is selected from the group consisting of a hydrogen atom; a methyl group and a methylthio group and R_6 is selected from the group consisting of an alkyl, alkylthio, aryl, arylthio, arylalkyl, aryloxy and hetercyclic groups, R_5 and R_6 together representing a substituted or

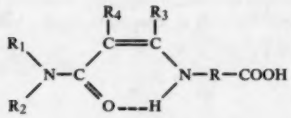
unsubstituted cycloalkyl or heterocyclic group, X is selectd from the group consisting of hydrogen atom, acetoxy group, and S—Y wherein Y is an alkyl, alkenyl, or nucleophilic group, wherein a 7-aminocephalosporanic acid or derivatives thereof are acylated with an N-protected amino acid and the resulting product is hydrolyzed followed by separation and recovery of said group member, the improvement which comprises:

(A) acylating the 7-aminocephalosporanic acid represented by the formula



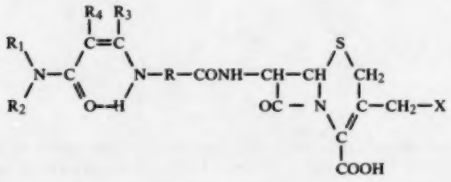
(II)

where X is defined as above, or derivatives thereof with a N-protected amino acid represented by the formula,

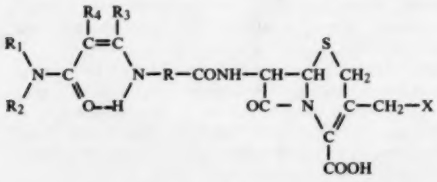


(III)

or functional acid derivative thereof, wherein R is the same as defined above, R_1 and R_2 each is a lower alkyl group having 1 to 3 nitrogen atom, R_1 and R_2 when taken together jointly form with the carbon atoms attached thereto a piperidine ring or a morpholine ring, R_3 is a lower alkyl group having 1 to 3 carbon atoms, R_4 is a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, R_3 and R_4 when taken together jointly form with the carbon atoms attached thereto a cyclopentenyl ring or a cyclohexenyl ring to form the corresponding N-protected 7-aminoacylamidocephalosporanic acid represented by the formula:

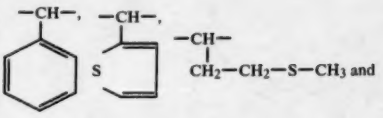


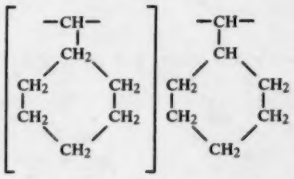
24. A compound selected from the group consisting of a cephalosporin of the formula:



(V)

and a non-toxic salt thereof, wherein R is selected from the group consisting of





X is selected from the group consisting of hydrogen atom and acetoxy group, R_1 and R_2 each is methyl or ethyl or jointly form together with the nitrogen atom attached thereto a piperidine ring or a morpholine ring, R_3 is a lower alkyl group having 1 to 3 carbon atoms, R_4 is a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, R_3 and R_4 when taken together jointly form with the carbon atoms attached thereto a cyclopentenyl ring.

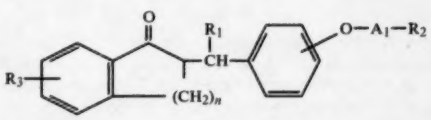
4,179,558

NAPHTHALENONE DERIVATIVES AND ANALOGS

John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 30, 1978, Ser. No. 873,644
Int. Cl.[2] C07D *295/00;* **A01N** *9/22*
U.S. Cl. 544—174 **18 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, alkyl, phenyl or phenyl substituted with a halogen, alkyl, alkoxy or trifluoromethyl group; R_2 is alkylamino, dialkylamino, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl, 4-alkyl-1-piperidinyl or 4-(2-hydroxyethyl)-1-piperidinyl; R_3 is hydrogen, halogen, alkyl, alkoxy, or trifluoromethyl; A_1 is a straight or a branched chain alkylene group having 2 to 5 carbon atoms; and n is 1, 2 or 3; wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

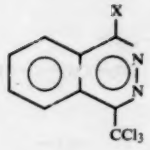
4,179,559

1-HALO- AND 1-LOWER ALKOXY-4-TRICHLOROMETHYLPHTHALAZINES

Eugene F. Rothgery, North Branford, and Hansjuergen A. Schroeder, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 844,004, Oct. 20, 1977, Pat. No. 4,139,622. This application Aug. 28, 1978, Ser. No. 937,692
Int. Cl.[2] C07D *237/30*
U.S. Cl. 544—237 **5 Claims**

1. A compound of the formula



where X is either a halo group or a lower alkoxy group.

4,179,560

IMIDAZO- AND PYRIMIDO[2,1-b]QUINAZOLINES AND PREPARATION THEREOF

Michihiro Yamamoto; Shigeaki Morooka; Masao Koshiba, all of Nishinomiya; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

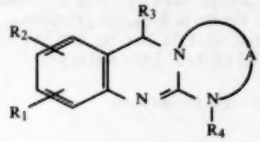
Filed Feb. 27, 1975, Ser. No. 553,676

Claims priority, application Japan, Feb. 28, 1974, 49-24500

Int. Cl.[2] A61K *31/395;* C07D *487/04*

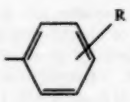
U.S. Cl. 544—250 **4 Claims**

1. A process for preparing a compound of the formula,

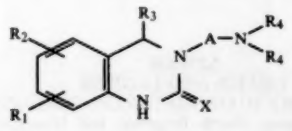


[I]

wherein R_1 and R_2 are independently hydrogen, halogen, trifluoromethyl, nitro, C_{1-4} alkyl or C_{1-4} alkoxy, or R_1 and R_2 may together represent methylenedioxy; R_3 is hydrogen, C_{1-4} alkyl, phenyl or substituted phenyl of the formula



(wherein R is halogen, C_{1-4} alkyl or C_{1-4} alkoxy); R_4 is hydrogen, C_{1-4} alkyl or benzyl; and A is C_{2-3} alkene which may be optionally substituted by one or two C_{1-2} alkyl radicals; or a pharmaceuticaliy acceptable acid addition salt thereof, which comprises the step of reacting a compound of the formula,



[II]

wherein R_1, R_2, R_3, R_4 and A are as defined above; and X is oxygen or sulfur, with a halogenating agent selected from the group consisting of phosphorus oxyhalide, phosphorus trihalide, phosphorus pentahalide, thionyl chloride and a mixture thereof, at a temperature within the range of from about 30° C. to about 180° C.

4,179,561

METHOD FOR MAKING PYRAZOLO[1,5-C]QUINAZOLINE DERIVATIVES AND RELATED COMPOUNDS

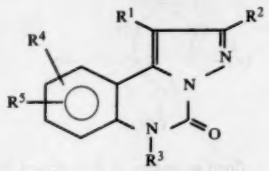
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 778,397, Mar. 17, 1977, Pat. No. 4,112,096, which is a division of Ser. No. 702,364, Jul. 2, 1976, Pat. No. 4,076,818. This application Dec. 2, 1977, Ser. No. 856,883

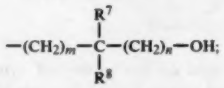
Int. Cl.[2] C07D *487/04;* A61K *31/505*

U.S. Cl. 544—250 **4 Claims**

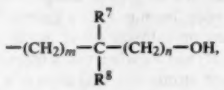
1. A method for preparing compounds havng the structure



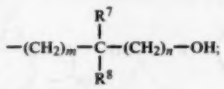
wherein R^1 and R^2 are the same or different, and R^1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, or



R^2 is selected from the group consisting of



hydrogen, lower alkyl, phenyl or phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, with the proviso that at least one of R^1 and R^2 is



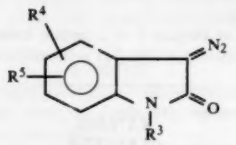
R^3 is selected from the group consisting of hydrogen, lower alkyl, benzyl, phenyl, or phenyl having a single substituent selected from the group consisting of lower alkoxy and trifluoromethyl;

R^4 and R^5 are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, lower alkanoyloxy of 1 to 4 carbons, nitro, benzyloxy, benzyloxy having a single mono-lower alkoxy substituent, halogen, hydroxy, and trifluoromethyl;

R^7 and R^8 may be the same or different and are selected from the group consisting of hydrogen, alkyl having 1 to 3 carbons, phenyl, phenyl having a mono-lower alkoxy substituent, benzyl, or benzyl having a mono-lower alkoxy substituent, or R^7 and R^8 taken together is a single cycloalkyl ring of 3 to 7 carbons;

$(CH_2)_m$ and $(CH_2)_n$ represent straight or branched chain alkylene radicals, m and n are integers which may be the same of different and are 0 to 10, with the proviso that

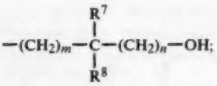
m+n is ≦10, and where m is 0, $(CH_2)_m$ represents a single bond, or where n is 0, $(CH_2)_n$ represents a single bond; and physiologically acceptable salts thereof, which comprises the steps of reacting a compound of the structure



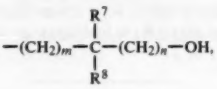
with an acetylenic compound of the structure

$$R^1—C{\equiv}C—R^2$$

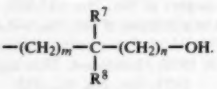
wherein R^1 and R^2 are the same or different, and R^1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, or



R^2 is selected from the group consisting of



hydrogen, lower alkyl, phenyl or phenyl having a single substituent selected from the group consisting of halogen, lower alkyl, lower alkoxy, and trifluoromethyl, with the proviso that at least one of R^1 and R^2 is



4,179,562

2,4-DIAMINO-5-ALKYLOXY-PYRIMIDINES

Roger J. Ponsford, Horsham, England, assignor to Beecham Group Limited, England

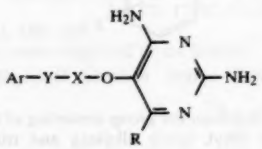
Filed Jul. 14, 1977, Ser. No. 815,565

Claims priority, application United Kingdom, Jul. 29, 1976, 31582/76

Int. Cl.[2] **C07D** *239/48*

U.S. Cl. 544—298 **26 Claims**

1. A compound of the formula (II):



(II)

or a pharmaceutically acceptable salt thereof wherein R is hydrogen, methyl or ethyl; X is alkylene of 1 to 10 carbon atoms; Y is O or S; and Ar is phenyl, naphthyl, anthranyl, phenanthryl or phenyl substituted by from 1 to 5 substituents selected from the group consisting of fluorine, chlorine, bromine, lower alkoxyl, lower acyloxyl, lower lkyl, lower alkenyl, cycloalkyl of 5 or 6 carbon atoms, cycloalkenyl of 5 or 6 carbon atoms and lower alkylthio.

4,179,563

3-ARYLOXY-SUBSTITUTED-AMINOPYRIDINES AND METHODS FOR THEIR PRODUCTION

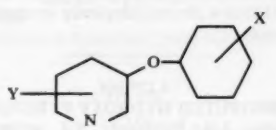
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 19, 1978, Ser. No. 907,422

Int. Cl.[2] **A61K** *31/44, 31/505;* **C07D** *213/65, 401/04*

U.S. Cl. 544—360 **8 Claims**

1. A compound of the formula



and pharmaceutically acceptable acid addition salts thereof; where X is hydrogen, fluorine or chlorine and Y is 1-piperazinyl, 3-methyl-1-piperazinyl, hexahydro-2-methyl-1-H-1, 4-diazepin-1-yl, anilino, or 2[di(lower alkyl)amino] ethylamino.

4,179,564

1,5,6,11-TETRAHYDRO[5,6]CYCLOHEPTA[1,2-b]PYRAZOLO[4,3-e]PYRIDINE DERIVATIVES

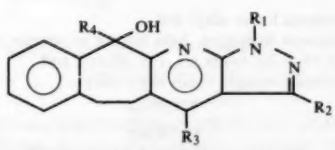
Hans Hoehn, Tegernheim, Del.X; Jack Bernstein, New Brunswick, N.J., and Berthold R. Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 785,398, Apr. 7, 1977, Pat. No. 4,111,940. This application Jun. 23, 1978, Ser. No. 918,638

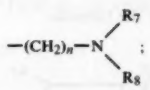
Int. Cl.[2] **C07D** *471/04*

U.S. Cl. 546—64 **9 Claims**

1. A compound of the formula:



wherein R_1 is lower alkyl, phenyl, or phenyl-lower alkyl; R_2 is hydrogen, lower alkyl, or phenyl; R_3 is hydrogen, halogen, or lower alkoxy; R_4 is hydrogen or



n is an integer from 2 to 6; and R_7 and R_8 are the same or different and each is lower alkyl or R_7 and R_8 taken together with N-atom form a heterocyclic ring of the formula

wherein R_9 is hydrogen or lower alkyl; and a pharmaceutically acceptable acid addition salt thereof.

4,179,565

2,5-DIMETHYL-BENZO[b]-THIENO[2,3-b]MORPHAN AND PRECURSORS THEREOF

Ricardo Granados Jarque, Barcelona; Mercedes Alvarez Domingo, San Juan Despi; Juan Bosch Cartes, Barcelona; Cristóbal Martinez Roldán, and Fernando Rabadan Peinado, both of Madrid, all of Spain, assignors to Laboratorios Made, S.A., Madrid, Spain

Filed Jan. 23, 1978, Ser. No. 871,653

Claims priority, application Spain, Feb. 25, 1977, 456.283

Int. Cl.[2] C07D *495/08, 409/06*

U.S. Cl. 546—63 **4 Claims**

1. A compound selected from the group consisting of 2,5-dimethyl-benzo[b]-thieno[2,3-f]morphan (I), 2-(3-benzo[b]-thienylmethyl)-1,4-dimethyl-1,2,3,6-tetrahydropyridine (II) or 2-(3-benzo[b]-thienylmethyl)-1,4-dimethyl-1,2,5,6-tetrahydropyridine (III) or a pharmacologically acceptable acid addition salt thereof.

4,179,566

SUBSTITUTED HYDROXY PYRIDONES

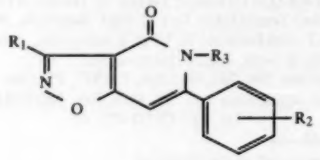
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Division of Ser. No. 759,399, Jan. 14, 1977, Pat. No. 4,120,967, which is a division of Ser. No. 664,237, Mar. 5, 1976, Pat. No. 4,024,262, which is a continuation-in-part of Ser. No. 602,324, Aug. 6, 1975, abandoned. This application Jul. 17, 1978, Ser. No. 925,388

Int. Cl.[2] C07D *498/04, 261/14*

U.S. Cl. 546—116 **3 Claims**

1. A compound of the formula



where

R_1 represents lower alkyl and

R_2 represents hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl or alkoxy, and

R_3 represents straight chain lower alkyl.

4,179,567

2-ARYLTROPANE COMPOUNDS

Robert L. Clarke, Bethlehem, and Sol J. Daum, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,894

Int. Cl.[2] C07D *471/08*

U.S. Cl. 546—124 **42 Claims**

1. A compound of the formula:

wherein:

R is selected from the group consisting of:
hydrogen,
alkyl of 1–8 carbon atoms optionally interrupted by an oxygen atom,
phenylalkyl where alkyl has 1–3 carbon atoms,
cyclopropylmethyl,
hydroxyalkyl of 2–4 carbon atoms, and
2,2-diethoxyethyl;

Ar is selected from the group consisting of:
phenyl,
benzyl,
3-hydroxyphenyl,
3-methoxyphenyl, and
2-thienyl; and

R′ is hydrogen or alkyl of 1 to 3 carbon atoms;

or a pharmaceutically acceptable acid-addition salt thereof.

4,179,568

(N-LOWER ALKYL-3,5-DIOXO-3-PYRROLIDINYL)THIOALKANOYLPYRROLIDINE-AND PIPERIDINE-CARBOXYLIC ACID COMPOUNDS

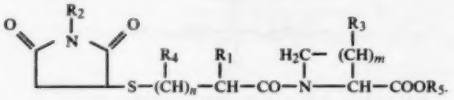
Allen I. Cohen, Highland Park, and Kishin J. Kripalani, East Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 31, 1978, Ser. No. 929,877

Int. Cl.[2] C07D *401/12, 403/12;* **A61K** *31/445, 31/40*

U.S. Cl. 546—208 **7 Claims**

1. A compound having the formula



or a salt thereof, wherein R_1 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkyl; R_2 is lower alkyl; R_3 is hydrogen, hydroxy or lower alkyl; R_5 is hydrogen or lower alkyl; m is 2 or 3; and n is 0, 1 or 2.

4,179,569

N-(4-PIPERIDINYL)-N-PHENYLAMIDES

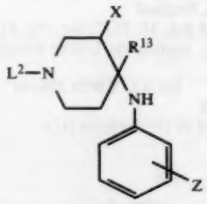
Paul A. J. Janssen, Vosselaar, and Georges H. P. Van Daele, Turnhout, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 695,509, Jun. 11, 1976, abandoned, which is a division of Ser. No. 648,685, Jan. 13, 1976, Pat. No. 3,998,834, which is a continuation-in-part of Ser. No. 558,511, Mar. 14, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 862,073

Int. Cl.[2] C07D *211/58*

U.S. Cl. 546—223 **3 Claims**

1. A compound selected from the group consisting of a piperidine derivative having the formula:



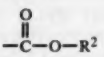
and the stereochemical optical isomeric forms thereof, wherein:

Z is a member selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy and trifluoromethyl;

X is a member selected from the group consisting of hydrogen and methyl;

L^2 is a member selected from the group consisting of alkyl having from 3 to 10 carbons and lower alkenyl; and

R^{13} is a carboxylate radical represented by the formula:



wherein R^2 is a member selected from the group consisting of lower alkyl, lower alkenyl and phenylmethyl.

4,179,570
PYRIDINES AND DIHYDROPYRIDINES

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 18, 1978, Ser. No. 970,415
Int. Cl.[2] C07D *213/16, 211/70*
U.S. Cl. 546—252 **6 Claims**

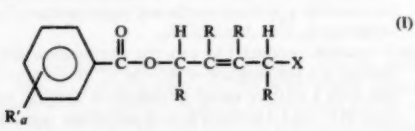
1. A process of preparing alkyl (or aralkyl) pyridines and N-substituted alkyl (or aralkyl) dihydropyridines which comprises treating a 2,5,6,8,9-pentaalkyl (or aralkyl) substituted 1,3,7-triazabicyclo (3,3,1) non-3-ene with a Lewis acid, in the presence or absence of a solvent and at a temperature range of from 100 to 300 degrees C.

4,179,571
MONOHALOALKENYL BENZOATES AND TRIHALOALKYL BENZOATES

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 540,568, Jan. 13, 1975, Pat. No. 4,158,655, which is a division of Ser. No. 245,387, Apr. 19, 1972, Pat. No. 3,879,445. This application Dec. 28, 1978, Ser. No. 973,977
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—64 **7 Claims**

1. Unsaturated monohaloalkenyl benzoate compounds represented by the general formula



(I)

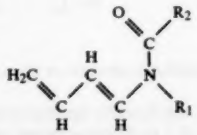
in which each R is individually selected from hydrogen and a radical which is alkyl, aryl, aralkyl, or alkaryl; X is halogen and is chlorine, bromine, or iodine; each R′ is individually selected from hydrogen or a radical which is cycloalkyl, aralkyl, or alkoxy, such that at least one R′ is cycloalkyl, aralkyl, or alkoxy; a is an integer and is 5; and wherein the total number of carbon atoms per said unsaturated monohaloalkenyl benzoate compound does not exceed 20.

4,179,572
TRANS-N-ACYL-N-ALKYL-1-AMINO-1,3-BUTADIENES AND TRANS-N-ACYL-N-ARYL-1-AMINO-1,3,-BUTADIENES

Wolfgang Oppolzer, Thônex, Switzerland, assignor to CHON Corporation, Cambridge, Mass.

Division of Ser. No. 647,049, Jan. 7, 1976, Pat. No. 4,065,496. This application Sep. 21, 1977, Ser. No. 835,322
Int. Cl.[2] C07C *125/06*
U.S. Cl. 560—115 **8 Claims**

1. A trans-compound of the formula



wherein R_1 is alkyl, 4-pentenyl, 4-hexenyl, 2-propenyl, or cycloalkyl and R_2 is alkoxy or aryloxy, wherein R_1 and R_2 each contain 1 to about 8 carbon atoms.

4,179,573
(2S,3R)-3-AMINO-2-HYDROXY-4-PHENYLBUTANOIC ACID

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo; Masa Hamada, Hoya, and Yoshiro Okami, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 690,457, May 27, 1976, Pat. No. 4,052,449, which is a continuation-in-part of Ser. No. 591,924, Jun. 30, 1975, abandoned. This application Aug. 19, 1977, Ser. No. 825,997
Claims priority, application Japan, Jul. 1, 1974, 49-75090
Int. Cl.[2] C07C *101/72*
U.S. Cl. 562—444 **1 Claim**

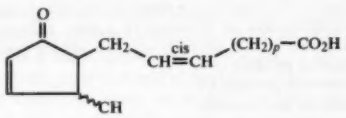
1. (2S,3R)-3-amino-2-hydroxy-4-phenylbutanoic acid.

4,179,574
NOVEL 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-ONES, 2-SUBSTITUTED-3,4-EPOXYCYCLOPENTAN-1-OLS, AND VARIOUS 2-SUBSTITUTED-CYCLO-PENTENONES

Karel F. Bernady; Middleton B. Floyd, Jr., both of Suffern; John F. Poletto, Nanuet, all of N.Y.; Robert E. Schaub, Upper Saddle River, and Martin J. Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 737,941, Nov. 2, 1976, abandoned, which is a division of Ser. No. 603,467, Aug. 11, 1975, abandoned, which is a division of Ser. No. 355,101, Apr. 27, 1973, abandoned. This application Sep. 22, 1977, Ser. No. 835,613
Int. Cl.[2] C07C *11/38*
U.S. Cl. 562—503 **2 Claims**

1. Compounds of the formula:



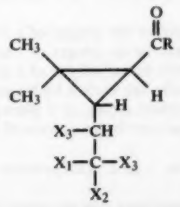
wherein p is an integer from 3 to 6 inclusive.

4,179,575
POLYHALOGENATED CARBOXYLIC ACIDS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel UCLAF, Paris, France

Filed Sep. 19, 1977, Ser. No. 834,573
Claims priority, application France, Sep. 21, 1976, 76 28279; Jul. 19, 1977, 77 22078
Int. Cl.[2] C07C *61/18;* A01N *9/30*
U.S. Cl. 562—506 **8 Claims**

1. A compound of the formula



wherein X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group

consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine and R is hydroxy in any of the possible isomer forms.

4,179,576

PROCESS FOR PREPARING PYRIDINE BASES

Tetsuya Miyake, Tokyo; Kohji Noguchi, and Kazuo Imamura, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 11, 1977, Ser. No. 841,083

Claims priority, application Japan, Oct. 27, 1976, 51/128192; Oct. 27, 1976, 51/128194; Oct. 27, 1976, 51/128195

Int. Cl.[2] C07D *213/16*

U.S. Cl. 546—251 **14 Claims**

1. A process for preparing pyridine bases from acetaldehyde and ammonia by gas phase catalytic reaction, wherein the gas phase catalytic reaction is carried out at a temperature of 300° to 550° C. and at a space velocity of 200 to 10,000 hr^{-1} in the presence of a catalyst prepared by subjecting silica-alumina to ion exchange with ions of a member selected from the group consisting of lead, tin, lead plus nickel, silver plus lead, silver plus cadmium, silver plus calcium, silver plus strontium, silver plus manganese, silver plus zinc, and silver plus tin to adsorb the ions on said silica-alumina.

4,179,577

POLYMERISABLE ESTERS DERIVED FROM A PHENOLIC UNSATURATED KETONE

George E. Green, Cherry Hinton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 633,770, Nov. 20, 1975, Pat. No. 4,079,183. This application Dec. 27, 1977, Ser. No. 865,042

Claims priority, application United Kingdom, Nov. 30, 1974, 51972/74

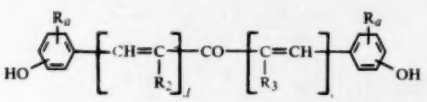
Int. Cl.[2] C07C *69/76, 69/95*

U.S. Cl. 560—52 **7 Claims**

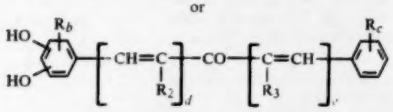
1. An ester as a composition of matter, which is soluble in an aqueous solution of a base before exposure to actinic radiation, but which polymerizes on exposure to actinic radiation and becomes insoluble in said aqueous solution, which comprises the condensation product of

(A) the reaction product of

(1) a phenol of the formula



or



where

each R represents a halogen atom, an alkyl, cycloalkyl, alkenyl or alkoxy group of 1 to 9 carbon atoms or a nitro group,

each a represents zero or an integer of 1 to 4,

each b represents zero or an integer of 1 to 3,

each c represents zero or an integer of 1 to 5,

R^2 and R^3 individually are each a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or a phenyl group, or conjointly denote a polymethylene chain of 2 to 4 methylene groups,

d and e are each zero, 1, or 2, with proviso that they are not both zero, and

(2) a compound containing one or more 1,2-epoxy groups comprising a glycidyl ether, N-glycidyl compound or S-glycidyl compound selected from the group consisting of the glycidyl ethers of ethylene glycol, of diethylene glycol, of poly(oxyethylene) glycol, of propane-1,2-diol, of poly(oxypropylene) glycol, of propane-1,3-diol, of butane-1,4-diol, of poly(oxytetramethylene) glycol, of pentane-1,5-diol, of hexane-1,6-diol, of hexane-2,4,6-triol, of glycerol, of 1,1,1-trimethylolpropane, of pentaerythritol, of sorbitol, of resorcitol, of quinitol, of bis(4-hydroxycyclohexyl)methane, of 2,2-bis(4'-hydroxycyclohexyl)-propane, of 1,1bis(hydroxymethyl)cyclohex-3-ene, of N,N-bis(2hydroxyethyl)aniline, of p,p'-bis(2-hydroxyethylamino)diphenylmethane, of resorcinol, of hydroquinone, of bis(4-hydroxyphenyl)methane, of 4,4'-dihydroxydiphenyl, of bis(4-hydroxyphenyl) sulfone, of 1,1,2,2-tetrakis(4-hydroxyphenyl)ethane, of 2,2-bis(4-hydroxyphenyl)propane, of 2,2-bis(3,5-dibromo-4-hydroxyphenyl)propane, of methanol, of ethanol, of n-butanol, of allyl alcohol, of phenol, of o-cresol, of m-cresol and of p-cresol; the N-glycidyl compounds of bis(4-aminophenyl)methane, of bis(4-aminophenyl) sulfone, of isocyanuric acid, of 5,5-dialkylhydantoins, of hydantoin, of uracil, of dihydrouracil, of parabanic acid, of bis(-(hydantoin-1-yl) methane, of ethyleneurea and of 1,3-propyleneurea; the N,N,O-triglyidyl compound of p-aminphenol; and the S-glycidyl compound of cyclododecanetrithol,

said phenol (1) and 1,2-epoxy compound (2) being reacted at a temperature of 80° to 150° C. in the presence of an inert solvent, a free-radical polymerization inhibitor and a ring opening catalyst selected from the group consisting of a tertiary amine and a quaternary ammonium compound, and in a ratio of from 0.75 to 1.25 phenolic hydroxyl equivalents per each 1,2-epoxide group in the epoxy co-reactant, with

(B) a dianhydride selected from the group consisting of benzophenone-3,3',4,4'-tetracarboxylic acid dianhydride, pyromellitic acid dianhydride and naphthalene-2,3,6,7-tetracarboxylic acid dianhydride,

said reaction product (A) and the dianhydride (B) being reacted at a temperature of 80°-150° C. in an inert solvent and with a tertiary amine esterification catalyst, and in a ratio of 0.7 to 1.2 carboxylic acid anhydride equivalents of the anhydride for each hydroxyl group of product (A).

4,179,578

PARA-PHENYL STILBENE DERIVATIVES

Fritz Fleck, Bottmingen; Hans Kittl, Riehen, and Salvatore Valenti, Bottmingen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

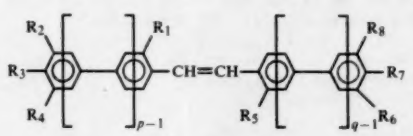
Division of Ser. No. 596,287, Jul. 16, 1975, Pat. No. 4,032,558, which is a continuation of Ser. No. 316,448, Dec. 19, 1972, abandoned. This application Apr. 14, 1977, Ser. No. 787,510

Claims priority, application Switzerland, Dec. 24, 1971, 18907/71; Jan. 26, 1972, 1123/72

Int. Cl.[2] C07C *63/60, 69/76*

U.S. Cl. 560—76 **5 Claims**

1. A compound of the formula,



I

in which

R_1 and R_5 each signifies hydrogen or linear alkyl of 1 to 4 carbon atoms,

R_2, R_3, R_4, R_6, R_7 and R_8 each signifies hydrogen, halogen, alkyl or alkoxy of 1 to 8 carbon atoms, alkenyl of 3 to 8 carbon atoms, or -COOR',

in which R' signifies hydrogen, alkyl of 1 to 22 carbon

atoms, hydroxyalkyl of 2 to 4 carbon atoms, phenyl or methyl- or chlorine-substituted phenyl,
p signifies an integer from 1 to 3, and
q signifies an integer from 1 to 3, provided that the total of p and q is 4, 5 or 6, at least one of
R_3 and R_7 being -COOR'.

4,179,579

SUBSTITUTED PROPARGYL ALCOHOLS, ALLYLIC ALCOHOLS AND UNSATURATED KETONES, AND METHODS FOR THE PRODUCTION THEREOF

Yoshiji Fujita; Fumio Wada; Takashi Ohnishi; Takashi Nishida, all of Kurashiki; Yoshiaki Omura, Mitsu; Fumio Mori, Kurashiki; Takeo Hosogai, Kurashiki, and Sukeji Aihara, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

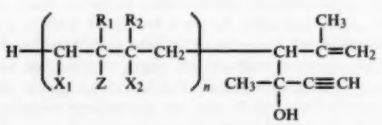
Continuation-in-part of Ser. No. 746,738, Dec. 2, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,875

Claims priority, application Japan, Dec. 2, 1975, 50-144267; Dec. 2, 1975, 50-144268; Dec. 30, 1975, 50-159584; Feb. 16, 1976, 51-16611

Int. Cl.[2] **C07C** *33/02, 33/04*

U.S. Cl. 568—840 **29 Claims**

1. An intermediate compound for the production of an unsaturated ketone via Oxy-Cope rearrangement reaction which comprises heating the corresponding allylic alcohol obtained by the hydrogenation of said compound to a temperature from 100° to 400° C., said compound being represented by the formula:



wherein X_1 and X_2 are both hydrogen atoms or wherein one of X_1 and X_2 is a hydrogen atom and the other jointly with Z represents a bond; Z jointly with X_1 or X_2 represents a bond, or separately represents a hydrogen atom; R_1 and R_2 are the same or different and represent hydrogen atoms or lower alkyl groups; n is 1 or 2; and when n is 2, X_1, X_2, Z, R_1, and R_2 may be the same or different.

4,179,580

ORGANIC CHEMICAL REACTION

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1978, Ser. No. 905,071

Int. Cl.[2] **C07C** *3/52*

U.S. Cl. 546—349 **23 Claims**

1. A process comprising reacting at least one non-conjugated non-aromatic olefinically unsaturated hydrocarbon with at least one active hydrogen-containing organic compound selected from the group consisting of monoolefinic hydrocarbons and carbocyclic aromatic or heterocyclic aromatic compounds having attached to an aromatic nuclear carbon atom a saturated carbon atom to which at least one hydrogen atom is bonded, in the presence of a catalytic amount a catalyst system consisting essentially of alkali metal promoted by elemental titanium under conditions such that a condensation product of said at least one active hydrogen-containing organic compound and said at least one non-conjugated non-aromatic olefinically unsaturated hydrocarbon is formed.

4,179,581

PARAFFINIC HYDROCARBON ISOMERIZATION PROCESS

Roy T. Mitsche, Wauconda, and George N. Pope, McHenry, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 788,376, Apr. 18, 1977, Pat. No. 4,098,874. This application Jun. 30, 1978, Ser. No. 921,159

Int. Cl.[2] **C07C** *5/28, 5/30*

U.S. Cl. 585—744 **17 Claims**

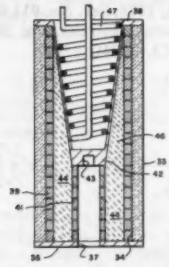
1. A process for isomerizing an isomerizable paraffinic hydrocarbon which comprises contacting said paraffinic hydrocarbon, at isomerization conditions, with a catalytic composite comprising a combination of a platinum group metal component and an alumina support wherein said support is prepared by admixing a finely divided alpha-alumina monohydrate with an aqueous ammoniacal solution having a pH of at least about 7.5 to form a stable suspension, commingling a catalytic metal salt of a strong acid with said suspension to form the suspension into an extrudable paste or dough, extruding the paste or dough to form an extrudate, drying and calcining said extrudate to form said alumina support.

4,179,582

HIGH VOLTAGE HIGH CURRENT CABLE TERMINAL WITH DUAL GRADING CAPACITOR STACK

Felipe G. Garcia, Sunnyvale, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 23, 1977, Ser. No. 854,155
Int. Cl.[2] H02G *15/22*; H01B *17/28*
U.S. Cl. 174—15 BH 10 Claims



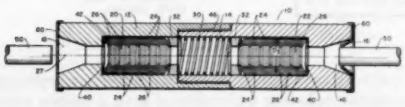
1. A high voltage cable terminal for an insulated high voltage cable having a high current carrying capacity, comprising: an insulating shell, an external grading capacitor stack mounted adjacent to the inside surface of said insulating shell and operating to grade the interface between said insulating shell and the surrounding environment, an internal grading capacitor stack mounted substantially concentrically within and being shorter than said external capacitor stack, being spaced therefrom, being adapted to surround the high voltage cable, and operating to grade the interface between the insulated high voltage cable and surrounding insulation, a conductor end member mounted at one end of said shell closing one end of the space between said internal and external capacitor stacks, a ground end member mounted at the other end of said shell closing the other end of the space between said internal and external capacitor stacks, whereby a closed chamber is formed therebetween, a dielectric within said closed chamber, said conductor and ground end members being formed to connect to a high voltage conductor and to pass the insulated high voltage cable respectively.

4,179,583

ELECTRO-MECHANICAL LOW BACKLASH CABLE CONNECTOR

Sergius S. Sergev, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1978, Ser. No. 883,557
Int. Cl.[2] H01R *5/00, 5/08*
U.S. Cl. 174—21 R 16 Claims



1. An electro mechanical connector comprising:

a. a housing containing a plurality of chambers respectively having a plurality of openings with each opening being adapted to receive an insertion member;

b. gripping means inwardly inclined within each said chamber and engageable between said insertion member and said housing for preventing withdrawal of said insertion member, said gripping means including a plurality of aligned, inwardly biased spring washers for engaging said insertion member and spacer means disposed between each spring washer for maintaining independent actuation of each said spring washer; and

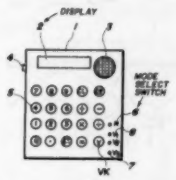
c. means adjacent each said chamber opening for maintaining said gripping means inwardly inclined.

4,179,584

SYNTHETIC-SPEECH CALCULATORS

Akira Tanimoto, Kashihara; Sigeaki Masuzawa, Nara; Shinya Shibata, Nara, and Shinzo Nishizaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 28, 1978, Ser. No. 882,267
Claims priority, application Japan, Feb. 28, 1977, 52-22083; Mar. 1, 1977, 52-22514; Mar. 23, 1977, 52-32487
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SM 16 Claims



1. A synthetic-speech calculator having a housing comprising:

a keyboard having digit keys and function keys;

a processor unit for performing operations on numerical information entered via said keyboard resulting in specific operation results of said keyed information;

means for producing audible sound signals indicative of said operation results, said operation results being presented audibly digit by digit or, said operation results being capable of being audibly presented in groups each group comprising three-digits including a punctuation mark followed by another group comprising three-digits including a punctuation mark;

mode selector means selectable on said housing for directing said synthetic-speech calculator to generate the audible sound signal either digit by digit or in three-digit groups.

4,179,585

VARIABLE RATIO FULL RANGE DIRECT-REFLECTED PYRAMID INCLINED LOUDSPEAKER

Gilles R. Herrenschmidt, 71 rue de Passy, 75016 Paris, France

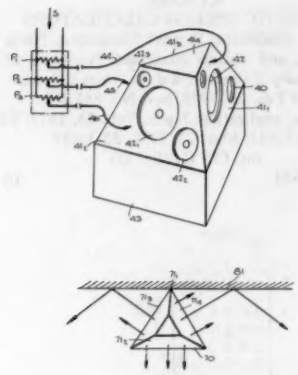
Filed May 9, 1978, Ser. No. 904,330
Claims priority, application France, Oct. 27, 1977, 77 32517
Int. Cl.[2] H04R *1/20*
U.S. Cl. 179—1 E 5 Claims

1. A loudspeaker arrangement adapted to provide variable direct and reflected sounds at a desired ratio with the loudspeaker arrangement disposed adjacent a wall external to the speaker enclosure and disposed between said wall and a listening area, including

means for producing reflected sounds including first and second sidewalls of a truncated pyramid formed enclosure, said first and second sidewalls including acoustic transducers and meeting at a junction with the junction being adjacent and facing said will with the first and second sidewalls being directed at the wall with sound emanating from the first and second sidewalls striking the wall before being reflected toward the listening area;

means for producing direct sounds having relatively high, middle and low sound frequencies, said direct sound producing means including the third sidewall of the pyramid formed enclosure, and including acoustic transducers for producing at least low sound frequencies and mid-range sound frequencies with the third sidewall and the included transducers being disposed opposite said junction and

facing the listening area and having an angle with respect to the vertical of approximately 15° so that sound emanating from said third sidewall will reach a listener before being reflected by surfaces external to the speaker arrangement,



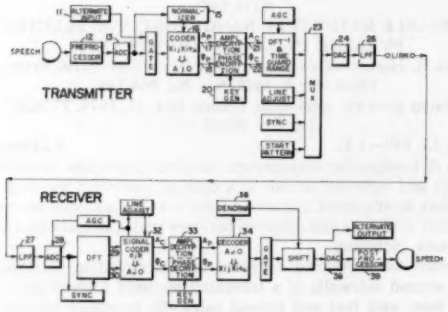
control means for increasing and decreasing the quantity of reflected sound relative to direct sound including means for respectively increasing and decreasing the output of transducers in the first and second sidewalls relative to the output of the transducer in the third sidewall.

4,179,586

SYSTEM OF ENCODED SPEECH TRANSMISSION AND RECEPTION

Mitford M. Mathews, Jr., deceased, late of Silver Spring, Md. (by Georgina H. Mathews, executrix); Thomas E. Tremain, Laurel, and Myron T. Zmurko, Bowie, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 2, 1972, Ser. No. 277,211
Int. Cl.[2] H04K *1/00*
U.S. Cl. 179—1.5 R **17 Claims**



1. A system of information transmission and reception comprising:

means for obtaining values for amplitude and phase of a digital information signal, the values being related to the original amplitude and phase by predefined algorithms;

means for separately routing said values in separate signal paths;

means for transforming the information in said signal paths from the frequency domain into the time domain;

means for modulating a number of carrier tones with the information in said signal paths, the output of said modulating means being suitable for transmission, and

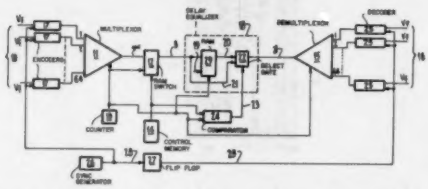
receiving means for recovering the original digital information.

4,179,587

BIT SWITCHING OF WORD FORMATTED DATA

Ludwik Herschtal, North Balwyn, Australia, assignor to L. M. Ericsson Pty. Ltd., Broadmeadows, Australia

Filed Jun. 1, 1978, Ser. No. 911,481
Claims priority, application Australia, Jun. 20, 1977, PD0511
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 179—15 AT **4 Claims**



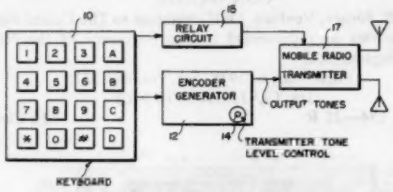
1. A method for serially bit-switching digital word synchronized (word aligned) data between inputs and outputs of a digital switch comprising the steps of converting data from different incoming channels to said switch into a bit interleaved bitstream on a single data highway, bit switching said bitstream via a switch memory, determining those bits which incur a switch memory delay as opposed to those bits which do not incur a said delay, applying a said delay to said bits which do not incur said delay, and applying a said delay to a synchronization signal for synchronizing the word boundary of outgoing data from the switch relative to a synchronization signal for synchronizing the word boundary of incoming data to the switch.

4,179,588

ENCODER UNIT FOR MOBILE RADIO TRANSMITTER

Joseph P. Oliveira, II, 8060 Willoughby Ave., Hollywood, Calif. 90046

Filed Nov. 14, 1977, Ser. No. 851,131
Int. Cl.[2] H04M *1/50;* **H04Q** *7/04*
U.S. Cl. 179—90 K **2 Claims**



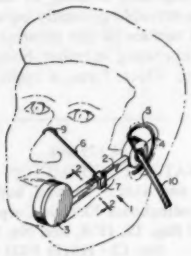
1. The multi-frequency encoder unit comprising: a keyboard switching circuit including a plurality of keys; a mobile radio transmitter; an encoder generator connected to said keyboard switching circuit and controlled thereby to generate selected dual tones for application to said mobile radio transmitter upon the selective operation of said keys; a relay including an energizing coil and a pair of contacts, said contacts being connected to said mobile radio transmitter to activate said transmitter when said energizing coil is energized; and circuit means including a plurality of diodes connecting said energizing coil to said keys so that actuation of any one of said keys causes the energizing coil to be energized to activate said transmitter, and said circuit means further including capacitor means for caus-

ing said relay coil to be de-energized a predetermined time interval after said keys are released.

4,179,589
PHONO CARTRIDGE
Kenkichi Tsukamoto, 47, Koyamashimofusa-cho, Kita-ku Kyoto-shi, Kyoto-fu, Japan
Continuation-in-part of Ser. No. 704,803, Jul. 13, 1976, abandoned. This application May 12, 1978, Ser. No. 905,351
Int. Cl.[2] H04R *11/08;* **G11B** *3/02*
U.S. Cl. 179—100.41 D **2 Claims**

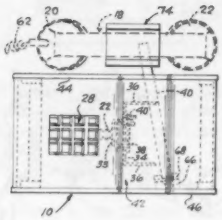
1. A phono-cartridge comprising a casing, a magnet mounted in the casing, a coil disposed to receive the magnetic flux of the magnet, a straight cantilever having a stylus tip on one end thereof for picking up information stored in grooves of a recorded disk, the magnet and the coil being driven relative to each other by the motions of the cantilever, the cantilever being supported by a suspension wire means limiting the motion in a direction along the cantilever axis and a leaf spring means limiting the motion around the cantilever axis, the suspension wire means engaging the leaf spring means to form a fulcrum on or above the cantilever at about a 90 degree angle, the action line formed by connecting the top of the stylus tip and the fulcrum made by the suspension wire means and the leaf spring means being coincident with the gravitational center of the cantilever.

4,179,590
APPARATUS FOR CONTROLLING RELATED EQUIPMENT AND FOR ENABLING HAND FREE USAGE
Milton L. Snow, 150 Fifth Ave., New York, N.Y. 10011
Filed Dec. 23, 1977, Ser. No. 863,881
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—156 A **24 Claims**



1. An apparatus for use with a telephone instrument and other equipment connected therewith, for simultaneous use in conjunction with the telephone instrument, such as: a timing device, a recording device, and the like; said instrument and equipment each having respective on-off switch means, said apparatus comprising: faceset means formed of a transmitter-receiver assembly and associated support means; said support means being provided as part of said assembly for supporting said assembly along a user's face, by positioning said transmitter in proximity to a user's mouth and said receiver in proximity to said user's ear and module means being operatively associated with said telephone instrument, other equipment, and faceset means, having on-off switch means and electrical circuitry providing electrical signals to said telephone instrument and the transfer of said signals between said faceset means and said telephone instrument; and mechanical linkage means, said linkage means being adapted to actuate said telephone instrument on-off switch means when said telephone instrument is placed in working relationship with said module means, to actuate said module means on-off switch means for controlling the operation of said faceset and other equipment in circuit relation to said telephone instrument.

4,179,591
TELEPHONE COVER
William M. Becker, 5915 Onondoga Rd., Bethesda, Md. 20016
Filed Jun. 30, 1978, Ser. No. 921,118
Int. Cl.[2] H04M *1/02*
U.S. Cl. 179—179 **4 Claims**



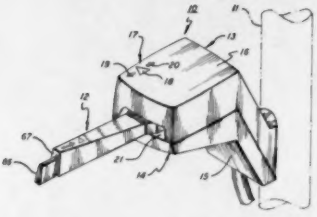
1. A substitute cover, to replace that of a modern, single line, desk, or table top, telephone, of the type which cradles the handset transversely between four fixed posts and across the top of the instrument, comprising a hollow shell of generally rectangular configuration having top and side walls and open at the bottom, said shell being adapted to be secured to the horizontal base of a telephone instrument by the normal securing means of the instrument so as to house without change or rearrangement its working circuits and parts other than the handset, said top wall having an upwardly and forwardly sloping rear portion, a generally flat, horizontal center portion and a forwardly and downwardly sloping forward portion, an opening in said forward portion of the top wall for reception of a telephone dialing unit, an elongated bar pivoted at one end within said shell and extending substantially entirely across the hollow interior with its free end protruding through an opening in a side wall of the shell, a cradle arranged to seat a handset alongside and longitudinally of said shell and fixed to the free end of said bar outside the shell, said bar being adapted to rest by gravity on a switch actuator within the shell and to be moved upwardly by the actuator when the handset is lifted from said cradle, and said opening in the side wall of the shell being sufficiently large to permit up and down rocking movements of the arm so that seating a handset on the cradle lowers the bar and moves the switch actuator and switch to off position, while lifting the handset from the cradle permits the switch actuator to lift the bar and close the telephone switch to its on position, whereby removing the normal instrument cover and substituting said cover vastly improves the aesthetic appearance of the telephone without changing or moving any other component parts or circuits and without need for any special tools.

4,179,592
SIGNAL SWITCH ASSEMBLY
Edward J. Nitsch, Camillus, N.Y., assignor to R. E. Dietz Co., Syracuse, N.Y.
Filed Dec. 21, 1977, Ser. No. 862,864
Int. Cl.[2] H01H *3/16;* **B60Q** *1/46*
U.S. Cl. 200—61.27 **13 Claims**

1. A signal switch for use in a motor vehicle including a housing that is adapted to be secured to said vehicle, first and second electrical contact units contained within

said housing, said first unit being arranged when actuated to electrically connect front and rear lamps mounted on the right side of the vehicle to circuit means for illuminating said right side lamps and said second unit being arranged when actuated to electrically connect front and rear lamps on the left side of the vehicle to said circuit means for illuminating said left side lamps,

a movable arm affixed to a flat spring, said spring being rotatably supported within said housing upon a pivot pin so that said arm is rotatable about said pivot within a first plane of rotation and independently deflectable upon said spring within a second plane that is substantially perpendicular with said first plane of rotation regardless of the rotational position of said arm, said arm extending outwardly from said housing through an opening formed in a sidewall thereof and having an actuator means associated therewith that is normally located in a neutral position



between said two contact units and being arranged to actuate said contacts of said first unit when said arm is rotated in one direction to a first operative position and to actuate said contacts of said second unit when said arm is rotated in the opposite direction to a second operative position,

a slide slidably mounted within said arm and being arranged to move inwardly toward said housing from a home position to an extended position, said slide having camming means operatively associated therewith for simultaneously actuating said contacts of both of said units when said slide is in an extended position and for releasing said contacts when said slide is in the home position, and

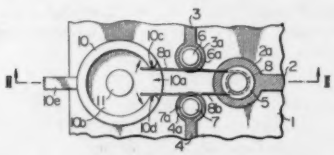
switch means supported adjacent to said arm within said housing, said switch means being actuated by said arm when said arm is deflected upon said spring in a plane generally perpendicular to said plane of rotation of said arm.

4,179,593

CHANGE-OVER SWITCH FOR PRINTED CIRCUIT BOARD

Katsuhiko Tsunefuji, Suwa, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 885,875
Int. Cl.[2] H01H 9/00
U.S. Cl. 200—292 **15 Claims**



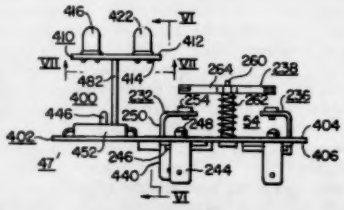
1. A change-over switch for a printed circuit board comprising: a substrate of an insulating material on which a plurality of patterned electrical circuit elements are formed; a first electrically conductive support stud fixedly mounted on the substrate in electrical contact with a first of said circuit elements and having a portion extending in front of a first surface of the substrate; a switching member formed of an electrically conductive, resilient wire and comprising a torsion spring having at least one turn wound on said portion of the support stud; said resilient wire having a first extension therefrom which is formed from said torsion spring and which is formed as a first movable contact; said resilient wire having a second extension therefrom which is formed from said torsion spring and which is formed as a second movable contact; said first and second extensions of said torsion spring extending generally in the same direction and being biased by said torsion spring to move in opposite directions; a second electrically conductive stud fixedly mounted on the substrate in electrical contact with a second of said patterned circuit elements and having a first section extending in front of said first surface, said first section of said second conductive stud being formed as a first stationary contact and disposed intermediate the length of said first extension; said first extension of the switching member being normally resiliently biased by said torsion spring and said first stationary contact being located in the path of movement of said first extension under its bias; a third electrically conductive stud fixed to said substrate and in electrical contact with a third of said patterned circuit elements and having a second section extending in front of said first surface; said second section of said third conductive stud being formed as a second stationary contact and disposed intermediate the length of said second extension; said second extension of the switching member being normally resiliently biased by said torsion spring and said second stationary contact being located in the path of movement of said second extension under its bias; said first and second extensions being normally biased toward engagement with said second and third studs, respectively, and an operating member for engaging the end portion of each said extension at the end thereof away from said first stud and past its respective said stationary contact for constraining or permitting movement of each said extension under its said normal bias to selectively connect or disconnect each said extension with the respective said stationary contact; said extensions and said stationary contacts being so placed that as said operating member moves one said extension to constrain it and thereby disconnect that said extension from its said stationary contact, said operating member, combined with said torsion spring, urges and permits the other said extension to connect that other said extension with its said stationary contact; said operating member comprising a body of electrically insulating material which is movable generally parallel to and with respect to the first surface of the substrate for engaging said extensions; said operating member being provided with a switching piece to which force is applied for moving said body.

4,179,594

ILLUMINATED PUSHBUTTON ASSEMBLY

Forrest E. Coyle, and Alan F. Mandel, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1978, Ser. No. 941,610
Int. Cl.[2] H01H 9/02
U.S. Cl. 200—310 **5 Claims**



1. An illuminable pushbutton assembly, comprising:
a housing having front and back sides, and a cavity accessi-

ble from the back side, said front side including a portion to be illuminated,

a first printed circuit board mounted on said housing,

a contact assembly mounted on said first printed circuit board,

an actuating member carried by said housing which is operatively coupled with said contact assembly,

and illuminating means including at least one solid state light source mounted on a second printed circuit board having an electrical circuit thereon connected to said at least one light source, electrical circuit elements mounted on said first printed circuit board having an electrical circuit thereon which interconnects said components, and stand-off means mounting said second printed circuit board on said first printed circuit board, said stand-off means rigidly spacing the second printed circuit board from the first printed circuit board, with the at least one light source adjacent to the portion of the housing to be illuminated, said stand-off means being formed of electrically conductive material and being electrically connected to the electrical circuits of both of said first and second printed circuit boards to provide a current carrying path between the first and second printed circuit boards as well as mechanical support for the second printed circuit board.

4,179,595

MULTIMODAL RESONANT CAVITY FOR VERY HIGH FREQUENCY HEATING

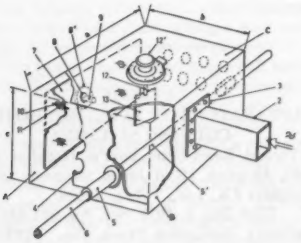
Georges Chiron, Chambery, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Aug. 15, 1977, Ser. No. 824,732

Claims priority, application France, Aug. 19, 1976, 76 25205

Int. Cl.[2] H05B *9/06*

U.S. Cl. 219—10.55 F **7 Claims**



1. High frequency heating apparatus comprising a resonant parallelepipedal metallic enclosure, generating means for generating high frequency electromagnetic energy in the microwave range, wave guide means for connecting the generator to the enclosure, the three dimensions of the enclosure being odd multiples of $\frac{1}{4}$ the wavelength of the electromagnetic energy generated by the generator; a rough adjustment member comprising a plate spaced parallel to one side of the enclosure and means mounting the plate for movement a distance in the range between zero and $\frac{1}{4}$ the wavelength of the energy supplied by the generator in a direction normal to the plane of said side of the enclosure; and a fine adjustment member having a planar surface facing the wave guide means and means for changing the angular relationship of the plane of the planar surface with respect to the wave guide means.

4,179,596

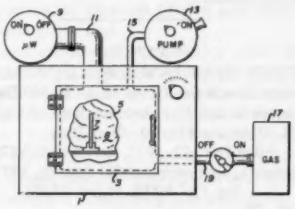
METHOD FOR PROCESSING FIBEROPTIC ELECTRONIC COMPONENTS OF ELECTRONIC VACUUM DEVICES

Lennart W. Bjork, Palo Alto, Calif., assignor to Litton Systems, Inc., San Carlos, Calif.

Filed Apr. 27, 1978, Ser. No. 900,716

Int. Cl.[2] C03B *37/10*

U.S. Cl. 219—10.55 M **1 Claim**



1. The method of removing entrapped contaminants from an already fused matrix of solid or hollow glass fibers, comprising the following steps to be performed after fusing and subsequent cooling of the matrix:

enclosing the matrix in a chamber for confining microwave energy;

subjecting the matrix in the chamber to microwave energy radiation to heat the entrapped contaminants and remove them from the matrix by outgassing without substantially heating the glass fibers; and

removing the gases from the chamber.

4,179,597

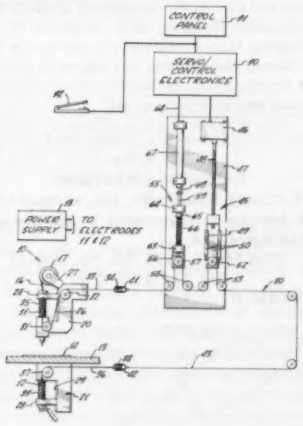
CONTINUOUS THRU-WIRE WELDING MACHINE

Stephen J. Bartholet, Orange, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Jul. 31, 1978, Ser. No. 929,735

Int. Cl.[2] B23K *11/00, 9/28*

U.S. Cl. 219—56.1 **11 Claims**



1. A welding machine for welding a conductor to a terminal comprising:

a pair of elongated conductive electrodes having adjacent ends mounted for axial movement toward said terminal;

a cable;

means for attaching said cable to said electrodes for moving same toward said terminal;

drive means operatively connected to said cable for applying a tension force thereto;

input means for establishing a predetermined force between

said electrodes and said terminal and for generating a first electrical signal proportional thereto;

sensing means operatively coupled to said cable for sensing the tension force therein and for generating a second electrical signal proportional thereto;

comparison means for comparing said first and second signals and for generating a third electrical signal as a function of said comparison; and

control means responsive to said third signal for controlling said drive means.

4,179,598

ELECTRIC RESISTANCE WELDING MACHINE

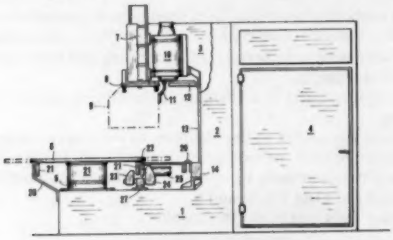
Attilio Alessio, Strada San Gillio 23, I - 10.040 Druento (Turin); Carlo Parpaiola, and Pier Antonio, both of Via Garibaldi 48, I - 10.091 Alpignano (Turin), all of Italy

Filed Dec. 22, 1977, Ser. No. 863,576

Claims priority, application Italy, Jan. 28, 1977, 67174 A/77

Int. Cl.² B23K *11/24, 37/04*

U.S. Cl. 219—79 **9 Claims**



9. An electric resistance welding machine comprising an upper bracket, an implement holding head vertically movable in said upper bracket, a welding transformer mechanically connected to said implement holding head, a vertical bar mechanically and electrically connected to said welding transformer, a lower bracket, a connection means mounted on said lower bracket and electrically connected to said vertical bar, a movable workpiece holding table mounted on said lower bracket, clamping means mounted on said lower bracket and engageable during the welding periods with portions of said table, and a flexible strap electrically connecting said connection means and said clamping means.

4,179,599

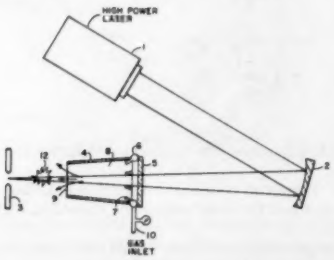
LASER PLASMATRON

Raymond W. Conrad, Russellville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,417

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 P **5 Claims**



1. A plasma generator comprising: a continuous wave, high power laser, focusing means for focusing radiation of said laser to an irradiance high enough to sustain a plasma, means for igniting said plasma, gas flow means adapted for directing gas at a controllable, variable velocity in the direction of and uniformly dispersed within said laser beam, said laser beam being coaxial with the flow of gas, and wherein said gas flow restrains plasma motion up the laser beam in response to the variation in gas velocity for controlling plasma temperature and position in the laser beam.

4,179,600

DEVICE FOR FUSING TONER ON A CARRIER OF ELECTROSTATIC IMAGES

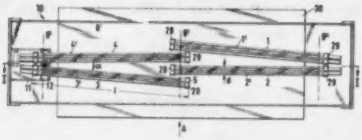
Helmuth Haberhauer, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,957

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724052

Int. Cl.² H01B *1/00*

U.S. Cl. 219—216 **14 Claims**



1. A device for fusing toner on a carrier of electrostatic images, said carrier having a predetermined width and moving through a fusion zone heated by infrared radiation, said device comprising a plurality of shortwave infrared radiating means arranged above and transverse to said moving direction of said carrier, each of said radiating means having a length less than the width of said carrier, each of said radiating means being mutually unaligned with the remaining plurality of said radiating means, and wherein the ends of said infrared radiating means are interleaved in a comb-like manner in the center of said fusion zone.

4,179,601

FIXING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

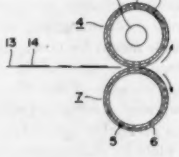
Noriyoshi Tarumi; Kenji Ueno, both of Hachioji, and Hirofumi Sakaguchi, Akigawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,345

Claims priority, application Japan, Jun. 7, 1977, 52-66273

Int. Cl.² H05B *1/00*

U.S. Cl. 219—216 **7 Claims**



1. A fixing apparatus for an electrophotographic copying machine which apparatus comprises a rotatable heated fixing roller having a resinous surface layer comprising a resinous fluorine material and carbon black.

4,179,602

METHOD AND SYSTEM OF VELOCITY CONTROL FOR AUTOMATIC WELDING APPARATUS

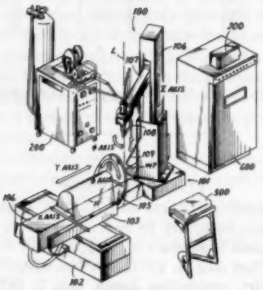
Shigeo Maruyama, Nishinomiya; Yuji Nishikaiji, Takarazuka; Tatsuya Miura, and Shigeki Fujinaga, both of Nishinomiya, all of Japan, assignors to Shin Meiwa Industry Co., Ltd., Japan

Filed Jul. 14, 1977, Ser. No. 815,783

Claims priority, application Japan, Jul. 16, 1976, 51-85427; Jul. 23, 1976, 51-88448; Jul. 23, 1976, 51-88449; Jul. 23, 1976, 51-88450; Jan. 20, 1977, 52-6280; Mar. 30, 1977, 52-36422; Mar. 30, 1977, 52-36423

Int. Cl.[2] B23K *9/12*

U.S. Cl. 219—125.1 **60 Claims**



1. In an automatic welding system comprising means for fixing a workpiece and means for holding a welding torch, said workpiece fixing means and said welding torch holding means having a mutual positional relationship with respect to each other in terms of an at least two-axis coordinate system and at least one of said workpiece fixing means and said welding torch holding means being movably mounted for allowing adjustment of said mutual positional relationship of said workpiece fixing means and said welding torch holding means in terms of said at least two axes of the coordinate system; a method for controlling adjustment of said mutual positional relationship, said method comprising the steps of:

(a) presetting position information concerning at least two positions, comprising at least an origin point and a destination point, between which said at least one of said workpiece fixing means and said welding torch holding means is to be moved through a plurality of interpolation points;

(b) presetting composite velocity information concerning the composite velocity of movement by said at least one of said workpiece fixing means and said welding torch holding means between said at least two positions;

(c) determining pitch information concerning said at least two axes based on said preset position information concerning said at least two positions for utilization of said pitch information with respect to a first one of said at least two positions and at each successive interpolation point;

(d) determining velocity component information concerning the velocity components, in terms of said at least two axes of the coordinate system, of said preset composite velocity of movement for utilization of said velocity component information with respect to a first one of said at least two positions and at each successive interpolation point;

(e) determining, based on said pitch information, a next successive interpolation point through which said at least one of said workpiece fixing means and said welding torch holding means is to pass;

(f) determining whether or not said next successive interpolation point exceeds said destination point;

(g) if said next successive interpolation point does not exceed said destination point, providing said velocity component information concerning the velocity components, determined in terms of said at least two axes of the coordinate system, as velocity commands of the respective axes, driving said at least one of said workpiece fixing means and said welding torch holding means in the directions of said axes in response to said determined velocity component information concerning the velocity components, determining whether or not there exists at least one of a clock condition and null condition defining reduced velocity of said at least one of said workpiece fixing means and said welding torch holding means, and, if said at least one of a clock condition and null condition does exist, repeating steps (c) through (g) for said next successive interpolation point; and

(h) if said next successive interpolation point does exceed said destination point, providing said preset position information and said preset velocity information concerning said destination point, and driving said at least one of said workpiece fixing means and said welding torch holding means in the directions of said axes in response to said provided preset position information and said preset velocity information concerning said destination point.

4,179,603

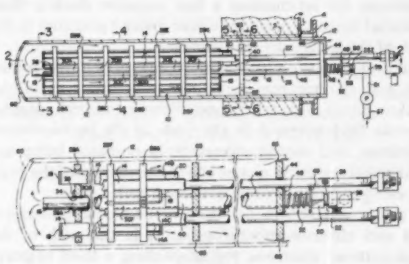
RADIAL BLADE HEATING DEVICE

Jon G. Zeigler, Salem; Elmer L. Kerr, Damascus, and David V. Bell, Hanoverton, all of Ohio, assignors to The Electric Furnace Company, Salem, Ohio

Filed Nov. 21, 1977, Ser. No. 853,274

Int. Cl.[2] H05B *3/02*

U.S. Cl. 219—538 **27 Claims**

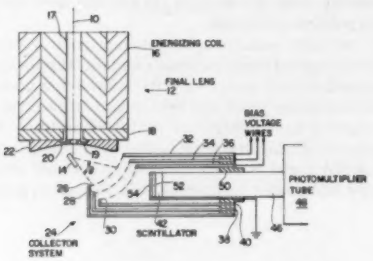


1. An electric heating device in an industrial furnace for heating metal work products by radiation and for being mounted adjacent to said metal work products, said electric heating device comprising: a plurality of rigid, straight, flat, rectangular interconnected conductors of rectangular cross section having cross sectional widths substantially greater than their thicknesses, the width portions of said conductors being radially aligned and concentric about a longitudinal support member; a plurality of rigid insulator means concentric about said support member and adapted to space said conductors one from another and from said support member without substantially inhibiting radiation of heat from said conductors and without restricting expansion and contraction of said conductors relative to said insulator means and said support member, means to space said plurality of insulator means apart longitudinally along said support member and means to secure said insulator means, said spacer means and said support member to form a substantially rigid self-supporting structure through which said conductors are free to expand and contract, whereby outward radiation of heat from said device is maximized and the life of said device is prolonged.

4,179,604
ELECTRON COLLECTOR FOR FORMING LOW-LOSS ELECTRON IMAGES

Aristos Christou, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1978, Ser. No. 946,986
Int. Cl.[2] H01J *39/00*
U.S. Cl. 250—305 **10 Claims**



1. In a device wherein a primary electron beam accelerated by a specific accelerating potential is scanned over the surface of a specimen and electron images are generated by collecting electrons scattered from the surface, an improved collector system for selectively collecting backscattered low-loss electrons having energies within a selectable energy range comprising:

electron-responsive means positioned in the path of the backscattered electrons for producing a signal when struck by an electron;

first grid means, positioned between said specimen and said electron-responsive means in the path of the backscattered electrons, for establishing a first negative electric field potential having a magnitude near ground potential in the path of the backscattered electrons;

second grid means, positioned between said first grid means and said electron-responsive means in the path of the backscattered electrons, for establishing a second negative electric field potential in the path of the backscattered electrons, said second electric field potential being approximately equal in magnitude to the energy of the lowest energy electrons to be collected; and

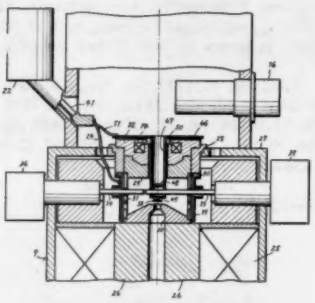
third grid means, positioned between said second grid means and said electron-responsive means in the path of the backscattered electrons, for establishing a third negative electric field potential in the path of the backscattered electrons, said third electric field potential being approximately equal in magnitude to the energy of the highest energy electrons to be collected.

4,179,605
COLD TRAP FOR ELECTRON MICROSCOPE

Hisao Watanabe, and Terukazu Etoh, both of Akishimashi, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1978, Ser. No. 917,288
Claims priority, application Japan, Jul. 11, 1977, 52-91893[U]
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 **4 Claims**

1. In an electron microscope the improvement comprising an objective lens having two annular coaxial magnetic pole pieces closely spaced axially and between which a specimen holder and an objective lens aperture plate are located, said annular pole pieces being axially spaced by an annular non-magnetic spacer, a cylindrical cold trap positioned radially outside the non-magnetic spacer and the space between said magnetic pole pieces, and means for cooling the trap such that residual gas molecules are absorbed by said trap, thereby preventing or

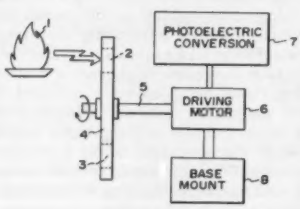


substantially reducing the build-up of contamination on the specimen.

4,179,606
FLAME SENSOR

Shunsaku Nakauchi, Mitaka, and Akifusa Takahashi, Tokyo, both of Japan, assignors to Security Patrols Co., Ltd. and Kokusai Gijutsu Kaihatsu Co., Ltd., both of Tokyo, Japan

Filed Aug. 1, 1977, Ser. No. 820,699
Claims priority, application Japan, Oct. 2, 1976, 51-117920
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—339 **12 Claims**



1. A flame sensor for monitoring the condition of a flame comprising a rotary disc having a first band-pass filter of an infra-red region containing a wavelength of a resonant radiation of carbon dioxide and a second band-pass filter of an infra-red region containing no such wavelength, a single photoelectric conversion device for measuring intensity of the radiation having passed said band-pass filters and a division circuit for providing a ratio of an output of the photoelectric conversion device containing the wavelength of the resonant radiation of the carbon dioxide to an output of the device containing no such wavelength.

4,179,607
GAMMA CAMERA SYSTEM WITH IMPROVED MEANS FOR CORRECTING NONUNIFORMITY

Kai Lange, Vedbaek, and Jørgen Jeppesen, Mariehøj, both of Denmark, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,895
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S **8 Claims**

1. In a scintillation camera system comprising means for producing scintillation events over a relatively large area field in response to interception of radiation, a plurality of photosensitive devices adjacent each other on one side of said photosensitive means for producing electric pulses in response to said scintillations, means responsive to said pulses by producing

analog signals representing respectively the x and y coordinates of the scintillations in said field, pulse height analyzer means and means responsive to said analyzer means determining that said pulses are within predetermined limits by producing z signals, and display means responsive to coincidence of z signals and said analog signals by producing intensity changes at coordinates corresponding with the coordinates of the scintillations to thereby form an image,

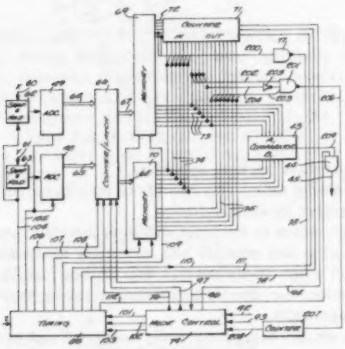
improved means for correcting for nonuniformity between the positions of said events and their positions on said display means comprising:

analog-to-digital converter means operative to convert said analog signals to digital x and y coordinate signals,

memory means having first locations corresponding respectively with small area increments in said large field and operative in response to occurrence of said digital coordinate signals during an accumulate mode to accumulate and store counts of said events in locations, respectively, substantially corresponding with the positions of said area increments, said counts being made when a uniform radiation source is presented to said means for producing scintillation events,

means for determining when a memory location has accumulated a predetermined number of counts of said events during the accumulation mode,

means responding to a determination that a particular memory location has accumulated said predetermined number



of counts of events by prohibiting the addition of counts to that particular memory location,

first means for counting the number of memory locations that have accrued said predetermined number of counts,

means responding to said means for counting have counted a selected number of locations containing said predetermined number counts by terminating counting of said events while a plurality of said locations still contain fewer than said predetermined number,

said memory means having second locations corresponding respectively with said area increments in said large field and operative in response to said digital coordinate signals occurring during a run mode to store counts of said events in locations, respectively, substantially corresponding with the positions of said area increments, said counts being made when a nonuniform radiation source is presented to said means for producing scintillation events,

comparator means operative during said run mode to compare the most significant bits of said accumulated counts from said first locations with a corresponding number of bits for the counts in said second locations, respectively, and to produce correction signals for each location, respectively, substantially equal in number to the difference in counts between the corresponding first and second locations, and

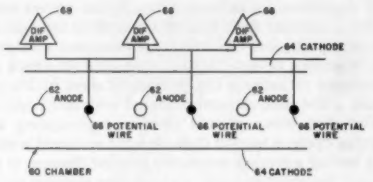
means operative in response to said correction signals to produce z signals and, hence, additional intensity changes in corresponding incremental areas of said display means.

4,179,608

RIGHT/LEFT ASSIGNMENT IN DRIFT CHAMBERS AND PROPORTIONAL MULTIWIRE CHAMBERS (PWC'S) USING INDUCED SIGNALS

Albert H. Walenta, Upton, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,678
Int. Cl.[2] H01J *39/28*
U.S. Cl. 250—385 **6 Claims**



1. An improved multiwire chamber for the detection and localization of ionizing radiation and having a plurality of anode wires wherein the improvement comprises:

(a) a pair of localizing wires spaced from substantially parallel to and coextensive with one of said anode wires, one wire of said pair being positioned on either side of said anode wire; and,

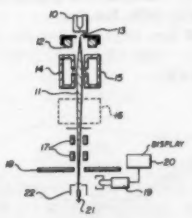
(b) means for determining the difference in signal between the wires of said pair caused by an ionizing event, whereby the ambiguity as to whether said event occurred to the right or left of said anode wire may be resolved.

4,179,609

POINT SCATTERING DETECTOR

Peter B. Sewell, 68 Cleadon, and Kovilvila N. Ramachandran, 40 Columbus Ave., both of Ottawa, Ontario, Canada

Filed Mar. 10, 1978, Ser. No. 885,295
Int. Cl.[2] G01N *27/00*
U.S. Cl. 250—397 **3 Claims**

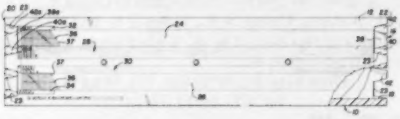


1. An imaging system for analyzing electron intensity distributions of electron beams in scanning electron microscopes and similar apparatus comprising a point scattering detector positioned in the electron beam where the distribution is to be measured and including a base, a metal rod having a sharpened tip adjustably mounted on the base, and an apertured plate mounted on but insulated from said base with its aperture positioned in the beam path and adapted to carry a positive electrical potential in relation to the tip such that the electrons can impinge on the sharpened tip of the detector causing secondary electrons to be emitted, means for collecting secondary electron from said tip, and means for measuring and displaying the secondary electron intensity to provide an image pattern of the electron beam.

4,179,610
APPARATUS TO INDICATE BIO-RHYTHM CURVES

James T. Chester, 13352 Maham Rd., Dallas, Tex. 75240

Filed Dec. 12, 1977, Ser. No. 859,743
Int. Cl.[2] G06C 3/00
U.S. Cl. 235—89 R 8 Claims

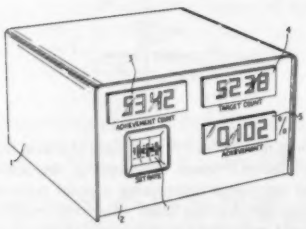


1. Apparatus for indicating bio-rhythm curves comprising: a body; a calendar scale having numerals to indicate the days of the year positioned on the body; a reference scale positioned at the beginning of the calendar scale, said reference scale being numbered to indicate the number of days within the longest cycle; a first slide element mounted with said body and having a first sine wave printed thereon representing a first bio-rhythm cycle; a second slide element mounted with said body and having a second sine wave printed thereon to represent a second bio-rhythm cycle; a third slide element mounted with said body having a third sine wave printed thereon representing a third bio-rhythm cycle, the first, second and third slide elements cooperating with said body to provide three bio-rhythm curves for a first individual over the calendar year; a fourth slide element mounted with said body and having a sine wave printed thereon representing one of the three bio-rhythmic cycles; a fifth slide element mounted with said body and having a sine wave printed thereon representing another of the three bio-rhythmic cycles; and a sixth slide element mounted with said body and having a sine wave printed thereon representing the third of the three bio-rhythmic curves, the fourth, fifth and sixth slide elements cooperating with said body to provide three additional bio-rhythmic curves for a second individual over the calendar year to thereby permit the first and second individuals to compare their bio-rhythm curves over such calendar year.

4,179,611
EFFICIENCY MONITORING DEVICE

Kenneth G. Mill, 21 Hayward Dr., Galashiels, Scotland; Christian P. Lynch, Portbello, Scotland; Richard T. Strathie, and Alexander F. H. Dixon, both of Tweedbank, Scotland, assignors to Kenneth G. Mill, Scotland

Filed Jan. 18, 1978, Ser. No. 870,422
Int. Cl.[2] G07C 3/10
U.S. Cl. 235—92 QC 4 Claims

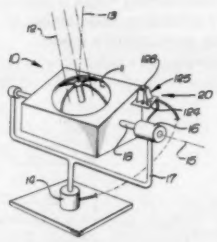


1. Monitoring equipment for use with a processing machine to indicate the efficiency of the machine in achieving a desired processing rate comprising, in combination, a housing remote from the machine, electronic clocking means within the housing to generate timing pulses, a presettable control with the housing to determine the rate at which pulses are fed from the clocking means to a computing circuit as a first signal, the presettable control including a manually settable device on which the repetition rate for the first signal can be set digitally, input terminals to the housing connected to the computing circuit to which input terminals can be attached a sensing means associated with the processing machine and which generates second signal pulses at a rate indicative of the performance of the machine in processing, the computing circuit including means to generate a third signal which represents a ratio of the first and second signals and including digital display devices on the housing on which, respectively, a cumulative count of the first and second signals and periodically updated values of the third signal are displayed.

4,179,612
RADIATION TRACKING CONTROL

Peter D. Smith, 1912 Kathryn Ct., Bakersfield, Calif. 93308

Filed Jan. 12, 1979, Ser. No. 2,884
Int. Cl.[2] G01J 1/20
U.S. Cl. 250—203 R 22 Claims



1. In radiation tracking apparatus,

(a) mounting means and two photo sensors carried thereby to receive incident radiation,

(b) edge means to intercept radiation directed toward each sensor so that primary and secondary locations on each sensor respectively receive and do not receive incident radiation, the sensors controlling tracking movement of the apparatus,

(c) the sensors being electrically energized and having electrical outputs which vary as a function of radiation interception by the sensors, and there being means responsive to said outputs to control said tracking movement,

(d) and there being control means connected with the sensors and responsive to increases and decreases in the intensity of said radiation to respectively decrease and increase electrical energization of the sensors.

4,179,613
BOW DRAW INDICATOR AND SIGHTING DEVICE

James T. Koren, 1915 Grand St., Trevose, Pa. 19047

Filed May 1, 1978, Ser. No. 901,859
Int. Cl.[2] F41G 1/32
U.S. Cl. 250—215 15 Claims

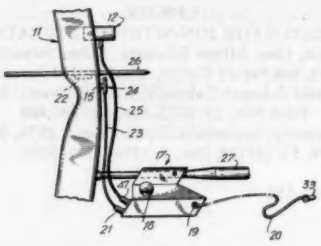
1. A device suitable for attaching to an archery bow comprising the combination of

(a) An energy source,

(b) A photoelectric sensor connected to the energy source which activates a signal means when an arrow used with the bow is at predetermined draw,

(c) A vertical control means which inactivates said signal means when the bow is canted more than a predetermined angle from vertical, and

(d) A sight means connected to the energy source and containing thereon adjustable omnidirectional sensor means



set to activate a signal when the bow is not directed to the elevation at which the omnidirectional sensors are set.

4,179,614

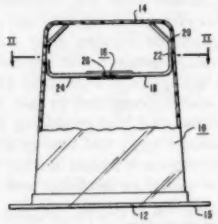
THERMOLUMINESCENT DOSIMETER SYSTEM

Patrick E. Felice, Hempfield Township, Allegheny County; Joseph L. Gonzalez, White Oak Borough, and John G. Seidel, McCandless Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 3, 1978, Ser. No. 874,976

Int. Cl.[2] G01V *5/00;* **H05B** *33/00;* **G01T** *1/11*

U.S. Cl. 250—253 **8 Claims**



6. Apparatus for locating underground deposits of uranium by thermoluminescence produced by the alpha particle decay from radioactive radon gas and its daughter products comprising:

a cup-shaped body open at one end and closed at the other end, so that the open end can be placed upon the ground within a test bore hole;

a dosimeter support bracket disposed within the cup-shaped body and having an aperture through the bracket, including means for removably mounting the bracket to the cup-shaped body side walls;

a thin thermoluminescent body fitted within the aperture in the mounting bracket;

a pair of thin metallized plastic films which are transmissive to alpha, beta and gamma radiation disposed on opposed sides of the mounting bracket over the aperture within which the thermoluminescent body is disposed; and

peripheral seal means for retaining the metallized plastic films on opposed sides of the mounting bracket and for providing a moisture and soil impenetrable barrier.

4,179,615

FARADAY DISH FOR MAKING MEASUREMENTS AT THE BEAM PATHS OF A HEAVY ION ACCELERATOR

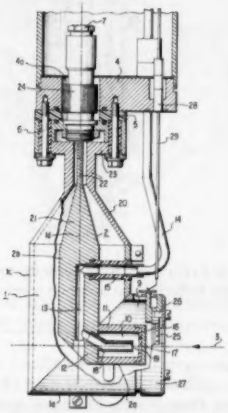
Hubert Kraus, and Peter Strehl, both of Wixhausen, Fed. Rep. of Germany, assignors to Gesellschaft fur Schwerionenforschung mbH, Darmstadt, Darmstadt, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,870

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740227

Int. Cl.[2] B01D *59/44*

U.S. Cl. 250—489 **10 Claims**



1. A Faraday dish for making measurements at a beam path of a heavy ion accelerator comprising

a supporting structure,

a hollow outer conductor including first and second portions secured to and insulated from said supporting structure, said first portion having an open end, the longitudinal axis of the first portion of said outer conductor being adapted for positioning substantially parallel to said beam path with the open end thereof transverse to said beam path, and the longitudinal axis of the second portion of said outer conductor being perpendicular to the longitudinal axis of the first portion of said outer conductor, and

an inner conductor having first and second portions positioned within said outer conductor, said first portion having an open end, the longitudinal axes of the first and second portions of said inner conductor being coaxial with the longitudinal axes of the first and second portions of said outer conductor, respectively.

4,179,616

APPARATUS FOR SANITIZING LIQUIDS WITH ULTRA-VIOLET RADIATION AND OZONE

Allan J. Coviello; Frederick E. Bernardin, Jr., both of Ann Arbor, and Robert R. Rohrkemper, Chelsea, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

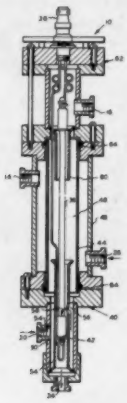
Continuation of Ser. No. 879,204, Feb. 21, 1978, abandoned. This application Oct. 2, 1978, Ser. No. 947,505

Int. Cl.[2] C02B *1/00, 1/38, 3/08;* **H01J** *61/52*

U.S. Cl. 250—527 **16 Claims**

1. Apparatus for sanitizing liquids comprising an elongated ultraviolet lamp, an inner duct surrounding the lamp and formed from a material which is transparent to the germicidal wavelengths of the ultraviolet light, an outer duct surrounding said inner duct, means to pass air through said inner duct so that said air is irradiated and ozone is formed, means to pass a liquid through said outer duct so that said liquid is irradiated, a tank, and means to pass the irradiated liquid and the irradiated air into said tank, the improvement comprising said inner duct including a zone wherein said air will flow at a predeter-

mined relatively slow rate so that the air that is irradiated will produce a relatively high concentration of ozone, and air means to pass cooling air at least a portion of the length



of the lamp at a relatively high velocity to maintain the lamp at a temperature sufficient to achieve a relatively high radiation output.

4,179,617

ION-NITRIDING APPARATUS

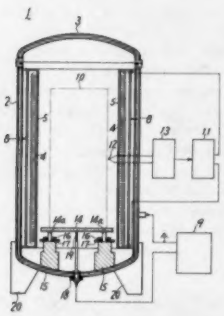
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Furuitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 29, 1977, Ser. No. 855,902

Claims priority, application Japan, Dec. 1, 1976, 51-145105

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—531 **6 Claims**



1. In an ion-nitriding apparatus for heating and nitriding a workpiece, said apparatus having:

a vacuum reacting furnace adapted to receive said workpiece therein;

heating means inside and spaced from the interior wall of said reacting furnace for heating the inside of said furnace;

screening means inside said furnace between the position for said workpiece and said heating means for electrically screening said heating means from said workpiece; and

voltage impressing means connected between said screening means as an anode and said workpiece as a cathode for creating a glow discharge,

an improvement comprising:

an outer wall covering means within said reacting furnace between said heating means and the interior wall of said furnace for selectively shielding said heating means from and opening said heating means toward said interior furnace wall, whereby the amount of heat released toward said furnace wall is controllable.

4,179,618

APPARATUS FOR ION-NITRIDING TREATMENT

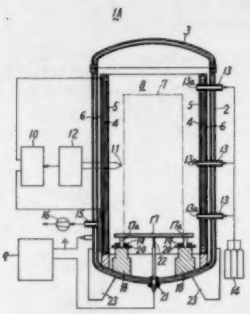
Akio Tanaka, Ono; Mizuo Edamura, Kobe; Satoshi Furuitsu, Kakogawa, and Satoru Kunise, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Nov. 29, 1977, Ser. No. 855,908

Claims priority, application Japan, Dec. 1, 1976, 51/145102; Dec. 1, 1976, 51/145103; Dec. 1, 1976, 51/145104

Int. Cl.[2] B01K *1/00*

U.S. Cl. 250—531 **2 Claims**



1. In an apparatus for ion-nitriding a workpiece, said apparatus having:

a vacuum reacting furnace adapted to receive said workpiece;

a heat-producing element inside said vacuum reacting furnace;

an inner wall screening body between said heat-producing element and said workpiece for electrically screening said heat-producing element from said workpiece;

a first power source connected between said screening body and said workpiece for creating glow discharge by impressing DC voltage between said screening body as an anode and said workpiece as a cathode; and

a second power source connected to said heat-producing element for heating said heat-producing element by impressing AC voltage upon said heat-producing element, whereby said workpiece is heated and ion-nitrided by the combined use of said glow discharge and heat generated by said heat-producing element;

an improvement comprising:

control means connected to said first and second power sources for controlling the temperature inside said furnace by concurrently controlling the voltage impressed from said first and second power sources in relation to the temperature inside said furnace, whereby the heat generated by said heat-producing element and the heat generated during glow discharge are maintained at desired levels, said voltage impressed by said second power source to said heat-producing element having a maximum value of 220 volts.

4,179,619

OPTOCOUPLER HAVING INTERNAL REFLECTION AND IMPROVED ISOLATION CAPABILITIES

James S. Cook, Tully, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,755

Int. Cl.[2] G02B *27/00*

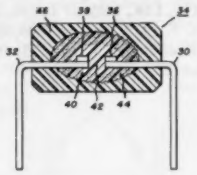
U.S. Cl. 250—551 **21 Claims**

1. An optoelectric device comprising:

an optical source;

an optical sensor spaced apart from said optical source; and

means for providing enhanced transmission of radiation between said source and said sensor including an essentially homogeneous body of solid dielectric medium having an inner light transmissive region, optically coupling



said optical source and said optical sensor, and an outer light reflective region essentially surrounding said inner light transmissive region, said inner and outer regions being simultaneously cured to eliminate an interface therebetween.

4,179,620

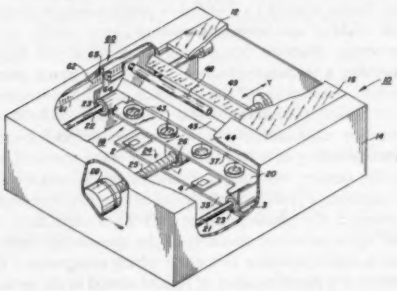
CROSSOVER ARRANGEMENT FOR MULTIPLE SCANNING ARRAYS

Martin A. Agulnek, Sharon, Mass., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 793,001, May 2, 1977. This application Apr. 17, 1978, Ser. No. 896,857

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—566 **2 Claims**



1. In a raster imaging apparatus for producing images on a member in response to image signals, the improvement comprising:

at least two imaging arrays, each of said arrays comprising a plurality of discrete imaging elements arranged in succession along the imaging axis of said array, the length of the area imaged by each of said arrays being less than the width of said member along said imaging axis;

means supporting said arrays for movement relative to said member with the imaging axis of said arrays extending in a direction substantially perpendicular to the direction of said movement;

said arrays being supported so that the areas imaged by each of said arrays overlap whereby to provide a composite imaged area;

and image signal input means for inputting image signals to said array imaging elements to actuate said imaging elements selectively in accordance with said image signals to produce images on said member, said image signal input means including crossover means for crossing over from one array to the next succeeding array within the overlapping portion of the areas imaged by each of said arrays on a random basis.

4,179,621

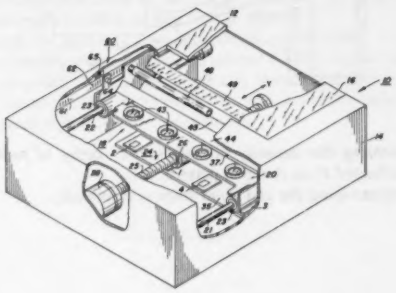
SCANNING APPARATUS

Peter A. Crean; Pierre A. Lavallee, both of Penfield, N.Y., and Martin A. Agulnek, Sharon, Mass., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 793,202, May 2, 1977. This application Apr. 17, 1978, Ser. No. 896,858

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—566 **9 Claims**



1. In a raster imaging apparatus for producing images on a member in response to image signals, the improvement comprising:

at least two imaging arrays, each of said arrays comprising a plurality of discrete imaging elements arranged in succession along the imaging axis of said array, the length of the area imaged by each of said arrays being less than the width of said member along said imaging axis;

means supporting said arrays for movement relative to said member with the imaging axis of said arrays extending in a direction substantially perpendicular to the direction of said movement;

said arrays being supported so that the areas imaged by each of said arrays overlap whereby to provide a composite image area; and

image signal input means for inputting image signals to said array imaging elements to actuate said imaging elements selectively in accordance with said image signals to produce images on said member, said image signal input means crossing over from one array to the next succeeding array within the overlapping portion of the areas imaged by each of said arrays.

4,179,622

METHOD AND SYSTEM FOR IN SITU CONTROL OF MATERIAL REMOVAL PROCESSES

Holger Moritz, Holzgerlingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1978, Ser. No. 900,028

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728361

Int. Cl.[2] G01N *21/30*

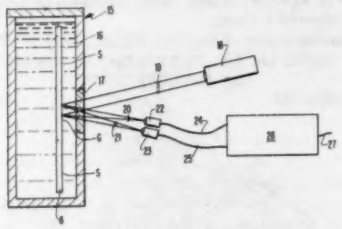
U.S. Cl. 250—571 **17 Claims**

1. A method of detecting the end point in a process for removing material from a workpiece, said workpiece comprising at least a support layer of one material supporting a top layer of a radiation sensitive material, comprising the steps of:

a. forming, by exposure to radiation of the radiation sensitive top layer, a grid pattern on the workpiece in addition to the pattern of material to be removed,

b. positioning the workpiece, in a material removal environment so that said material removal process acts to remove portions of said top layer,

c. directing a beam of monochromatic radiation onto the grid pattern,



d. sensing the intensity of a diffraction order of radiation reflected from the grid pattern, and

e. determining the end point from said intensity.

4,179,623

PULSED LEVEL SENSOR

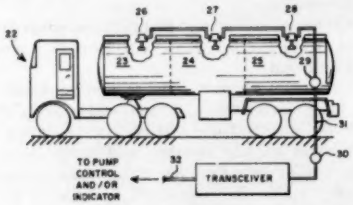
William F. Jacobsen, Toronto, Canada, assignor to Honeywell Ltd., Scarborough, Canada

Filed Aug. 25, 1977, Ser. No. 827,494

Claims priority, application Canada, Sep. 2, 1976, 260390

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—573 **33 Claims**



1. An apparatus for continuously supplying pulses to sense the level of a material and for terminating said pulses when said material is at a predetermined level comprising:

first triggerable pulse means for supplying a pulse, said first triggerable pulse means having input means;

level sensing means connected to said first triggerable pulse means for transmitting said pulse to an output, and for blocking said pulse when said material is at a predetermined level;

second triggerable pulse means connected to said output of said level sensing means whereby said second triggerable pulse means is triggered by said pulse for supplying a pulse to an output;

means connecting said output of said second triggerable pulse means to said input means of said first triggerable pulse means whereby said pulse supplied by said second triggerable pulse means triggers said first triggerable pulse means to produce a second pulse; and,

output means connected to said output of said triggerable pulse means,

whereby said first triggerable pulse means supplies a pulse to said level sensing means each time said input means receives a pulse from second triggerable pulse means.

4,179,624

CARRIER CONTROL METHOD BY USING PHASE-PULSE SIGNALS

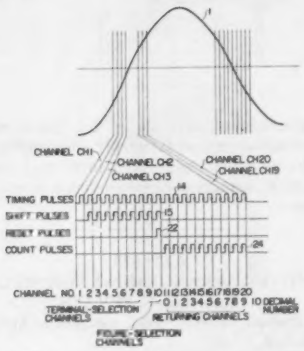
Yoshio Shindo, Sagamihara; Takahiro Kimijima, Kokubunji; Hiroyasu Onishi, Yokohama, and Masayasu Endo, Machida, all of Japan, assignors to The Tokyo Electric Power Co. Inc. and Osaki Electric Co., Ltd., both of Tokyo, Japan

Filed Oct. 7, 1977, Ser. No. 840,369

Claims priority, application Japan, Jan. 25, 1977, 52/6396

Int. Cl.[2] G08C *19/24*

U.S. Cl. 307—3 **4 Claims**


CHANNEL CH1
CHANNEL CH2
CHANNEL CH3
CHANNEL CH20
CHANNEL CH19
TIMING PULSES
SHIFT PULSES
RESET PULSES
COUNT PULSES
CHANNEL NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
0 1 2 3 4 5 6 7 8 9 10 DECIMAL NUMBER
TERMINAL-SELECTION CHANNELS
RETURNING CHANNELS
FIGURE-SELECTION CHANNELS

1. A carrier control method using phase-pulse signals comprising forming a plurality of terminal-selection channels, a plurality of figure-selection channels, and a plurality of returning channels having a respective predetermined phase width in one cycle of an alternating-current carrier wave; each of said returning channels being assigned a particular figure value; inserting a terminal-selection phase-pulse signal comprising a coded combination of the existence and the non-existence of a phase pulse of each terminal-selection channel in the terminal-selection channels of the alternating current carrier wave, corresponding to a code assigned to each terminal equipment at the center; inserting a figure-selection phase-pulse signal comprising a coded combination of the existence and the non-existence of a phase pulse of each figure-selection channel in the figure-selection channels of the alternating-current carrier wave, corresponding to a code which designates a figure of a datum of a plural number of figures stored in the terminal in the electrically readable state, also at the center; receiving the terminal-selection phase-pulse signal at the terminal equipment; inserting a returning phase-pulse signal comprising the existence and the non-existence of a phase pulse on only one of the returning channels of the alternating-current carrier wave at the terminal equipment, corresponding to the value of the designated figure of the datum memorized in the terminal, when a code of the terminal-selection phase-pulse signal coincides with the code of the terminal equipment; and receiving said returning phase-pulse signal at the center; the transmission of said terminal-selection phase-pulse signal and said figure-selection phase-pulse signal and the return of the returning phase-pulse signal being made for every figure of the datum stored in the terminal.

4,179,625

NOISE PULSE PRESENCE DETECTION CIRCUIT

Aaron B. Carter, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 28, 1977, Ser. No. 855,456

Int. Cl.[2] H03K *5/153, 5/18*

U.S. Cl. 307—234 **10 Claims**

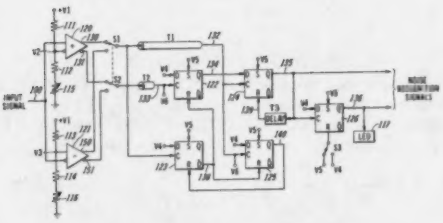
1. A noise pulse detection circuit, having an input terminal, for generating an output recognition signal indicative of an

incoming signal pulse applied to said input terminal having a pulse duration less than a prescribed duration, comprising:

circuit means having a first circuit terminal and a second circuit terminal;

delay means connected to said input terminal and to said first circuit terminal and responsive to a direct input signal applied to said input terminal for generating a delayed signal delayed by a predetermined period of time from said direct input signal and having a discernible leading edge and trailing edge;

characterized in that said noise pulse detection circuit further comprises:



signal inverter means connected to said input terminal and said second circuit terminal for generating an inverted input signal having a discernible leading edge and trailing edge, which is the logical inverse of said direct input signal applied to said input terminal; and

said circuit means is responsive to said delayed signal and said inverted input signal for generating an output recognition signal when said trailing edge of said inverted input signal is applied to said circuit means prior to said leading edge of said delayed signal.

4,179,626

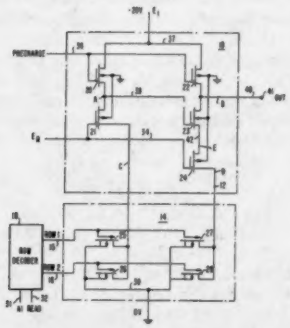
SENSE CIRCUIT FOR USE IN VARIABLE THRESHOLD TRANSISTOR MEMORY ARRAYS

Harry G. Oehler, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1978, Ser. No. 920,299

Int. Cl.[2] H03K *5/20;* **G11C** *7/00, 11/40;* **H03K** *3/353*

U.S. Cl. 307—238 **3 Claims**



1. A memory sense circuit for comparing the threshold voltage of a first and second variable threshold transistor wherein the source electrode of said first and second variable threshold transistors are coupled to a first voltage supply terminal and the gate electrodes are coupled to a first control signal terminal comprising:

third, fourth and fifth field effect transistors each having a gate, source and drain electrode,

the gate electrode of said third and fifth transistors coupled to a voltage source terminal,

the source electrode of said third transistor coupled to the drain electrode of said first variable threshold transistor,

the source electrode of said fifth transistor coupled to the drain electrode of said second variable threshold transistor,

the drain electrode of said third transistor coupled to the gate electrode of said fourth transistor,

the drain electrode of said fifth transistor coupled to the source electrode of said fourth transistor,

means for applying a second control signal, and

first means responsive to said second control signal for coupling the drain electrode of said third and fourth transistors to a return path of said first voltage supply terminal to precharge selected circuit nodes.

4,179,627

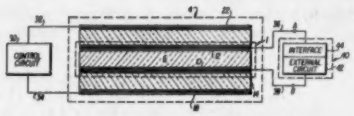
ELECTRICAL APPARATUS

Ronald P. Reitz, Annapolis, Md., assignor to Tom Swift Enterprises, Inc., Annapolis, Md.

Continuation-in-part of Ser. No. 805,399, Jun. 10, 1977, Pat. No. 4,126,149. This application Mar. 8, 1978, Ser. No. 884,396

Int. Cl.[2] H01L *31/04*

U.S. Cl. 307—261 **26 Claims**



1. An electrical apparatus comprising:

(a) a first electrode having major opposed surfaces;

(b) a first dielectric having major opposed surfaces, one surface thereof positioned proximate one surface of said first dielectric;

(c) a second electrode having major opposed surfaces, one surface thereof positioned proximate the other surface of said first dielectric;

(d) a second dielectric positioned proximate the other surface of said second electrode;

(e) a third electrode having major opposed surfaces, one surface thereof positioned proximate said second dielectric and generally facing said other surface of said second electrode, said second dielectric thereby positioned in between said second and third electrodes;

(f) a third dielectric having major opposed surfaces, one surface thereof positioned proximate the other surface of said third electrode;

(g) a fourth electrode having major opposed surfaces, one surface thereof positioned proximate the other surface of said third dielectric;

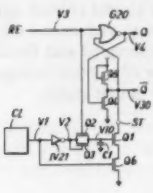
(h) means connecting said first and fourth electrodes to a control circuit whereby an electrical potential is established between said first and fourth electrodes; and

(i) means connecting said second and third electrodes to an external circuit whereby, upon operation of said external circuit, said second and third electrodes are connected in said external circuit.

4,179,628
FLIP-FLOP HAVING RESET PREFERENTIAL FUNCTION

Tsutomu Ohgishi, Hirakata; Toru Akiyama, and Tadashi Sakurai, both of Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Nov. 21, 1977, Ser. No. 853,584
Claims priority, application Japan, May 13, 1977, 52-55614; May 17, 1977, 52-57188
Int. Cl.[2] H03K *3/286, 3/353, 5/20;* **H03D** *13/00*
U.S. Cl. 307—279 **19 Claims**



1. A flip-flop having a set input terminal and a reset input terminal, comprising

field effect switching means coupled to said set input terminal and having a gate electrode,

capacitance means formed associated with said gate electrode of said field effect switching means,

set signal source means coupled through said field effect switching means to said set input terminal for providing a set signal through said field effect switching means to said set input terminal,

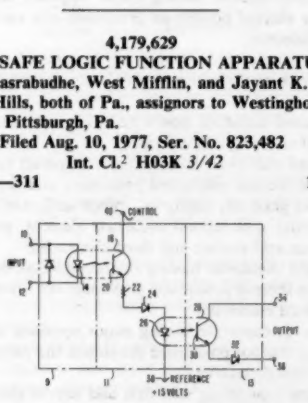
reset signal source means coupled to said reset input terminal for providing a reset signal to said reset input terminal, and

charging/discharging control means operatively coupled to said set signal source means for precharging said capacitance means prior to said set signal and operatively coupled to said reset signal source means for discharging said capacitance means responsive to said reset signal, said field effect switching means being rendered conductive as a function of the electric charge stored in said capacitance means, whereby said set signal is applied through said field effect switching means to said set input terminal as a function of the conduction state of said field effect switching means.

4,179,629
FAILSAFE LOGIC FUNCTION APPARATUS

Arun P. Sahasrabudhe, West Mifflin, and Jayant K. Kapadia, Pleasant Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,482
Int. Cl.[2] H03K *3/42*
U.S. Cl. 307—311 **10 Claims**



1. In logic function apparatus having a predetermined voltage reference and providing an output signal in accordance with a first input signal and a second input signal applied to said apparatus, the combination of

first means having a voltage bias and including a first diode and emitting light energy in response to said first input signal,

second means including a second diode biased by the voltage reference and emitting light energy in response to said second input signal having a voltage greater than said voltage reference,

with said second means being responsive to the light energy emitted by said first means,

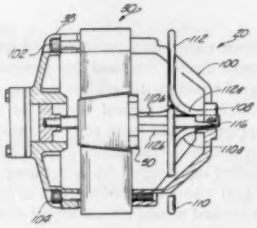
third means having a voltage bias and being coupled with the light energy emitted by said second means for providing said output signal, and

with said second means being provided with a voltage bias by the voltage reference that is different than the voltage bias across the first means and the third means.

4,179,630
LINEAR COMPRESSOR

Richard A. Stuber, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 738,708, Nov. 4, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 893,873
Int. Cl.[2] H02K *33/00*
U.S. Cl. 310—15 **23 Claims**



1. In a moving-iron linear-motor compressor of the type including a gas pump having a pumping chamber, a magnetic circuit fixedly attached to said gas pump and a magnetically permeable armature attached to a pumping member and disposed to axially reciprocate within an air-gap in said magnetic circuit, the improved magnetic core in said magnetic circuit comprising

first and second inner convoluted loops spirally wound of magnetic strip material and placed on a common plane perpendicular to the axis of reciprocation of said armature in flatwise abutment on a plane perpendicular to said common plane,

means clamping said abutting inner loops tightly together, and

means forming said air-gap in the area of flatwise abutment of said inner loops, the central axis of said air-gap being coaxial with said axis of reciprocation.

4,179,631
ELECTROMAGNETIC MOTOR

William S. Funderburg, 2103 Pender Ave., Wilmington, N.C. 27892

Continuation-in-part of Ser. No. 770,938, Feb. 24, 1977, abandoned. This application Dec. 5, 1977, Ser. No. 857,772
Int. Cl.[2] H02K *7/06*
U.S. Cl. 310—20 **1 Claim**

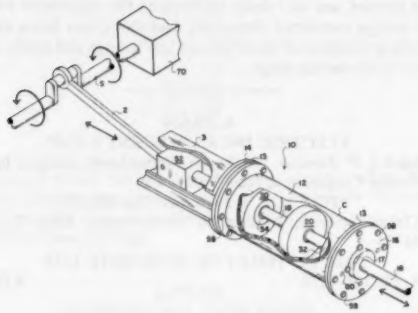
1. An electromagnetic motor comprising:

(a) a cylinder housing including a cylindrical shell enclosed at the ends thereof by a front and rear cylinder head, at least the front cylinder head having a central opening therein;

(b) a disc-shaped armature having a drive rod extending therefrom and through said central opening, bearing means in said front cylinder head surrounding said central opening and supporting said drive rod therein, said arma-

ture being thereby mounted for reciprocal movement in said cylinder housing, the diameter of said armature being less than the inner diameter of said cylindrical shell so that an air space exists therebetween;

(c) a toroidal shaped, bifilar wound electromagnetic coil mounted inside the front and rear ends of said housing adjacent said front and rear cylinder heads, at least the front end coils having a central opening therein aligned with and corresponding to the opening in said adjacent cylinder head;



(d) the arrangement and positioning of the magnetic coils and the armature being such that, upon activation of said armature, its path of movement is between said coils only and not within the central opening therein;

(e) a source of direct current and a switching means connecting said source of direct current with said magnetic coils in such a manner that said direct current is caused to flow alternatingly to one coil and then to the others; and

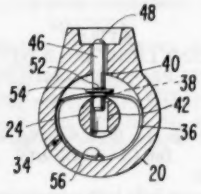
(f) a force transmitting means connected to the free end of said drive rod for delivering the force generated by said motor to a mechanism.

4,179,632

SPINDLE LOCKING MECHANISM FOR A ROTARY POWER DEVICE

Don L. Harvell, Greenville, S.C., assignor to The Singer Company, New York, N.Y.

Filed Dec. 6, 1978, Ser. No. 967,176
Int. Cl.² H02K *7/14*
U.S. Cl. 310—50 **7 Claims**



1. A manually operable locking mechanism for a rotary power tool, comprising:

a housing for the rotary power tool, said housing having an opening therein;

a spindle rotatably mounted within the housing, said spindle having a radially extending aperture in axial alignment with the housing opening;

a loop spring disposed adjacent the housing, said spring having a hole in alignment with the opening in the housing;

a lock pin having an outer section slidingly engaging the opening in the housing, a manually engagable button at its outer end extending radially outwardly from the housing, and a shaft at the inner end extending radially inwardly of the housing and through the hole of the loop spring; and

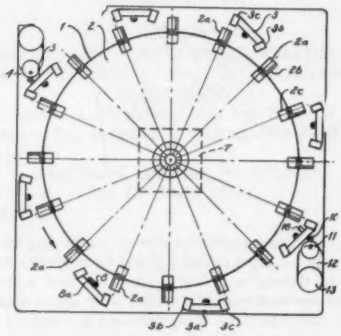
means connected to the lock pin for collapsing the loop spring radially inwardly so that, when the aperture in the spindle is aligned with the lock pin, the shaft of the lock pin may enter said aperture and thereby prevent rotation of the spindle.

4,179,633

MAGNETIC WHEEL DRIVE

Donald A. Kelly, 58-06 69th Pl., Maspeth, N.Y. 11378

Filed Feb. 21, 1978, Ser. No. 879,608
Int. Cl.² H02K *7/10*
U.S. Cl. 310—80 **10 Claims**



1. A magnetic wheel drive comprised of two basic coacting magnetic components which are,

a large flat non-magnetic wheel containing equally spaced identical permanent magnets secured to the outer rim of said large flat non-magnetic wheel with pole faces all exposed in the same direction.

support angles and bracket means for securing said identical permanent magnets to the outer rim of said large flat non-magnetic wheels,

a drive shaft secured to said large flat non-magnetic wheel by means of a central hub,

ball bearing support means for said drive shaft, one of said ball bearings is retained in a large rectangular base plate, a second ball bearing is retained in a box-base secured to said large rectangular base plate,

multiple identical oscillating magnet couples consisting of a rectangular flat non-magnetic plate on which opposite pole magnets are secured at the sides of said rectangular flat non-magnetic plate,

a pivot bracket fastened to the top and bottom of said rectangular flat non-magnetic plate, a pivot rod fitted into said large rectangular base plate, the opposite end of said pivot rod supported by an elongate Z bracket secured to said large rectangular base plate,

a support arm secured to said rectangular flat non-magnetic plate fitted with a cylindrical pin and ball bearing,

an eccentric in direct contact with said ball bearing, said eccentric fastened to the slow speed shaft of a gear reduction unit, said gear reduction unit is driven by a small D.C. motor,

a return tension spring fastened to said rectangular flat non-magnetic plate, retention of the opposite end of said return tension spring by a post pressed into said large rectangular base plate,

multiple arrays of silicon solar photovoltaic cells placed at convenient outside locations for the powering of said small D.C. motors, electrical conduction means from said solar photovoltaic cells to said small D.C. motors,

link arms fastened to some of said rectangular flat non-magnetic plates,

straight links pinned to said link arm on most of said rectangular flat non-magnetic plates,

connection of the end of one straight link with a link arm on one rectangular flat non-magnetic plate driven by one said small D.C. motor through said eccentric and ball bearing means.

4,179,634

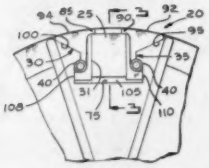
MAGNETO ROTOR CONSTRUCTION

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon-Company, Inc., East Longmeadow, Mass.

Filed Jun. 2, 1978, Ser. No. 911,898

Int. Cl.[2] H02K *28/22*

U.S. Cl. 310—153 **7 Claims**



1. Rotor for a magnetomotive device comprising an annular rotatable body having a cavity defined by nonmagnetic material in the rim thereof including locating surfaces, a permanent magnet and circumferentially spaced pole shoes disposed in said cavity, said pole shoes being disposed in clamping relation with said magnet and each pole shoe having an arcuate surface and other portions engaged with said magnet and said locating surfaces, and means for retaining said pole shoes in said clamping relation with said permanent magnet within said cavity and for urging said pole shoes radially against said locating surfaces which are oriented to cause said pole shoes to exert clamping forces against said magnet while said arcuate surfaces are held in coaxial relation in said rotor.

4,179,635

DEVICE FOR BRACING A STATOR WINDING DISPOSED IN THE AIR GAP OF A SYNCHRONOUS GENERATOR

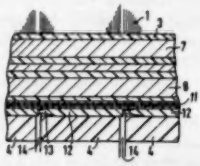
Heinrich Beermann, Mülheim, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,225

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633278

Int. Cl.[2] H02K *3/48*

U.S. Cl. 310—214 **3 Claims**



1. Device for bracing a stator winding disposed in the air gap of a synchronous generator and inserted into radially inwardly opening slots formed in a hollow cylindrical holding member of nonmagnetic steel received in a central bore formed in a stator lamination stack and radially supported by an inner hollow cylinder formed of synthetic material, the holding member and the hollow cylinder being subdivided axially and having radial cooling slots formed between the axial subdivisions thereof, the improvement therein which comprises the sections of the hollow cylinder being centered at the teeth disposed between the slots formed in the holding member and being flattened in vicinity of the individual winding slots, wedges of insulating material extending in axial direction of the generator in sections according to the axial subdivision and disposed between the hollow cylindrical sections and the radially inner winding bars of each slot, said wedges having parallel flanks and being beveled in a wedge-shaped manner at an end thereof, and slot shims interposing the uppermost bar and the wedge associated therewith, said slot shims being at least partly in the form of wave-shaped leaf springs and partly in the form of insulating strips.

4,179,636

ELECTRIC INCANDESCENT LAMP

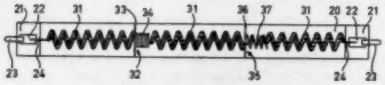
Eduard J. P. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 7, 1978, Ser. No. 884,375

Claims priority, application Netherlands, May 2, 1977, 7704774

Int. Cl.[2] H01J *1/96, 19/50;* **H01K** *1/18*

U.S. Cl. 313—274 **4 Claims**



1. An electric lamp which comprises: a tubular lamp envelope having a ball, a filament of helically wound wire disposed in generally axially aligned relationship in said envelope, first and second current supply conductors extending through said wall of said lamp envelope in a vacuum-tight manner, said filament having in axial sequence a first double coiled axial segment, a first single coiled axial segment and a second double coiled axial segment, said first double coiled axial segment being connected to said single coiled axial segment which is connected to said second double coiled axial segment, the inside diameters of each of said segments being equal, said filament being supported between the ends thereof by at least one axially elongated wire support which has a spiral part at one end which is disposed with the periphery thereof in contact with the interior of said wall of said lamp envelope, said support including a helix at the other end thereof, said helix contacting said first single coiled segment.

4,179,637

INCANDESCENT LIGHT BULB WITH MULTIPLE FILAMENTS PROVIDING MULTIPLE LIVES

James V. Santora, 1228 Irvine Ave., Newport Beach, Calif. 92660

Filed Apr. 14, 1978, Ser. No. 896,368

Int. Cl.[2] H01K *9/00*

U.S. Cl. 313—316 **21 Claims**

1. An incandescent light bulb comprising:

a first current supply member;

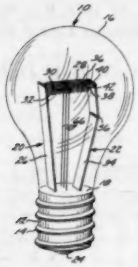
a second current supply member having at least one aperture;

a first electrically conductive filament capable of emitting light upon passage of current therethrough, the filament being permanently and electrically connected to the first and second current supply members;

at least one additional, electrically conductive reserve filament capable of emitting light upon passage of current therethrough, the reserve filament being electrically connected to the first current supply member and having an electrically insulating member which penetrates the aperture whereby the reserve filament is supported by the

second current supply member but is not electrically connected thereto, and

connecting means for electrically connecting the reserve



filament to the second current supply member when the first filament becomes inoperative whereby the reserve filament becomes operative to emit light upon passage of current therethrough.

4,179,638

CATHODE RAY TUBE PANEL

David C. Boyd, Corning; Henry E. Hagy, Painted Post, and David A. Thompson, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,150

Int. Cl.[2] H01J *29/86*; C03C *3/04*

U.S. Cl. 313—480 **3 Claims**

1. In a cathode ray tube for reception and display of color television comprising a display panel portion, a neck portion having an electron gun mounted therein, an intermediate funnel portion, and an electron mask having a pattern of perforations aligned with a pattern of phosphor configurations forming a screen on the panel, said panel consisting of a silicate glass having a low compaction when heated to temperatures between 400°–500° C., a strain point over 470° C., a liquidus below 900° C., and a composition, as calculated in weight percent from the batch on the oxide basis, chemically composed essentially of, in addition to silica, 1–3% Al_2O_3, 1.5–3% MgO, 2.5–4.5% CaO, 5–10% SrO, 3–10% BaO, 1–2.5% PbO, 6–10% Na_2O, 4–8% K_2O, the ratio of Na_2O:K_2O being at least 1:1, and the total content of SrO+BaO+CaO+MgO being 15–24%.

4,179,639

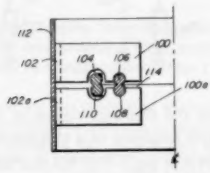
ANODE ASSEMBLY FOR ELECTRON DISCHARGE DEVICES

Palmer P. Derby, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 724,813, Sep. 20, 1976, which is a continuation of Ser. No. 571,891, Apr. 25, 1975, abandoned. This application Sep. 28, 1977, Ser. No. 837,652

Int. Cl.[2] H01J *23/22*

U.S. Cl. 315—39.69 **5 Claims**



1. An anode structure for an electromagnetic energy generator comprising:

a plurality of substantially similar shaped conductive anode member sections;

each of said anode member sections having a cylindrical boundary wall portion and a radially extending vane section joined at one end to said wall portion and having a free end;

at least one annular conductive strap member disposed between said conductive anode member sections and contacting alternative vanes of each of said anode member sections;

said conductive anode member sections being joined to said strap member by non-thermal metallurgical techniques to define an anode member; and

said conductive anode member sections being supported within a conductive shell and the adjacent boundary wall portions and vane section edges are spaced apart with contact only therebetween by said strap member.

4,179,640

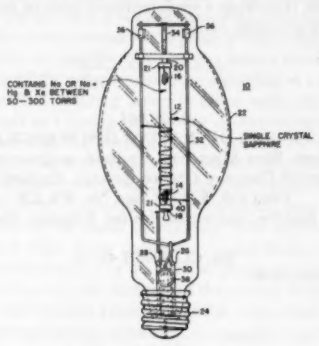
HID SODIUM LAMP WHICH INCORPORATES A HIGH PRESSURE OF XENON AND A TRIGGER STARTING ELECTRODE

Daniel A. Larson, Cedar Grove, N.J., and Robert J. Zollweg, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,482

Int. Cl.[2] H01J *17/34*

U.S. Cl. 315—47 **7 Claims**



1. A high-pressure sodium vapor discharge lamp adapted to be operated at about a predetermined nominal wattage input in conjunction with ballast means which generates a high-voltage starting pulse to initiate the lamp discharge and thereafter limit the current through said lamp to cause it to normally operate at about said predetermined wattage, said lamp comprising:

a. a sealed, light-transmitting, elongated, refractory arc tube of predetermined dimensions and design enclosing electrodes operatively positioned therein proximate the ends thereof, said arc tube during lamp operation is impervious to migration of sodium ions therethrough under the influence of an electrode field; a first pair of lead-in conductors sealed through said arc tube proximate the ends thereof, and one conductor of said first pair of lead-in conductors connecting to one of said electrodes and the other conductor of said first pair of lead-in conductors connecting to the other of said electrodes;

b. sodium in predetermined amount or sodium plus mercury in predetermined total amount and in predetermined atom ratio along with xenon at a fill pressure between 50 torrs to 300 torrs included in said arc tube as a starting and operating discharge-sustaining filling;

c. an outer light-transmitting envelope enclosing said arc tube to provide a predetermined operating environment therefor, external electric contact means secured to said outer envelope to provide electrical connection to said

lamp, and a second pair of lead-in conductors sealed through said outer envelope and connecting to said external electrical contact means;

d. metallic supporting frame means retained within said outer envelope and supporting said arc tube therein in predetermined position and electrically connecting said one conductor of said first pair of said lead-in conductors to one conductor of said second pair of said lead-in conductors, and said other conductor of said first pair of said lead-in conductors is electrically connected to the other conductor of said second pair of said lead-in conductors;

e. trigger starting means comprising an elongated refractory metal member directly connected at least at one end thereof to said frame means, said trigger starting means extending from said supporting frame means to a position contiguous with and at least partially surrounding that outer surface portion of said arc tube which is proximate said other electrode which connects to said other conductor of said first pair of said lead-in conductors, said elongated metal member also extending a predetermined distance toward said one electrode and along the outer surface of said arc tube and contiguous therewith; and

f. said predetermined discharge-sustaining filling coupled with said predetermined arc tube dimensions and design and operating environment therefor together with said nominal wattage input at which said lamp is intended to be operated causing said lamp to normally operate with about a predetermined rated voltage drop thereacross and to emit therefrom a predetermined spectral power distribution of visible emissions.

4,179,641

CIRCUITS FOR OPERATING DISCHARGE LAMPS

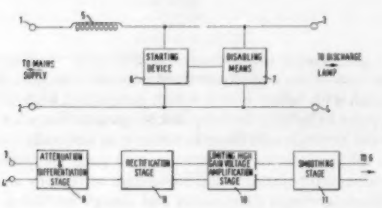
John Britton, West Kingsdown, England, assignor to The General Electric Company Limited, London, England

Filed Feb. 9, 1978, Ser. No. 876,229

Claims priority, application United Kingdom, Feb. 9, 1977, 5312/77

Int. Cl.[2] H05B *41/16*

U.S. Cl. 315—289 **3 Claims**



1. An electrical circuit for operating an electrical discharge lamp, the circuit comprising:

a pair of terminals for connection to a supply of voltage of substantially sinusoidal waveform;

a second pair of terminals for connection with a discharge lamp;

a ballast impedance connected between one of the first pair of terminals and one of the second pair of terminals;

a starting device for aiding initiation of discharge in the lamp; and

means for disabling the starting device when a discharge has been initiated in the lamp,

wherein the means for disabling the starting device is arranged to detect a change in the voltage waveform across the second pair of terminals from substantially sinusoidal to substantially square.

4,179,642

RASTER CORRECTION CIRCUIT WITH LOW DISSIPATION RESISTIVE DAMPING

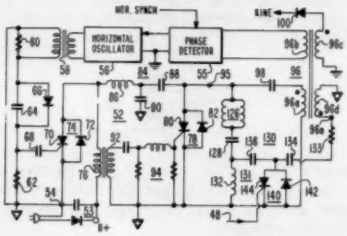
Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 10, 1978, Ser. No. 885,203

Claims priority, application United Kingdom, Sep. 2, 1977, 36792/77

Int. Cl.[2] H01J *29/56*

U.S. Cl. 315—370 **6 Claims**



1. A kinescope deflection arrangement, comprising:

a deflection winding;

deflection current generating means coupled with said deflection winding for promoting the flow of current therethrough, said deflection current generator also producing retrace voltage pulses at said winding;

raster distortion correction means, said correction means comprising variable impedance means serially coupled with said deflection winding, a portion of said retrace voltage pulses appearing across said impedance means;

a second source of voltage pulses in synchronism with said retrace pulses; and

resistance means coupled between said second source and said impedance means for attenuating transient voltages appearing across said impedance means.

4,179,643

CIRCUIT FOR VARYING AN OPERATING VOLTAGE OF A DEFLECTION AMPLIFIER OF A MAGNETODYNAMIC DEFLECTION SYSTEM

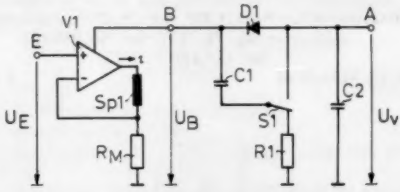
Hans Neuendorff, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,587

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1977, 2711535

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—411 **4 Claims**



1. In a circuit for the stepwise variation of an operating voltage of a deflection amplifier of a magnetodynamic deflection system for a charged-particle beam in dependence upon a required deflection speed, the improvement comprising

a single voltage supply source for generating a supply voltage,

at least one diode coupled to said voltage supply source and

poled in its forward conduction direction to an operating voltage terminal of said deflection amplifier,

at least one capacitor having one terminal thereof coupled to the cathode of said diode, and

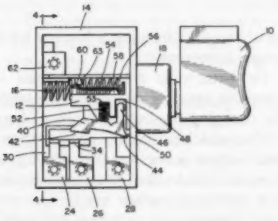
a switch coupled to the other terminal of said capacitor and driven by a control device for connecting said capacitor either to ground through a resistor or to the anode of said diode, said circuit generating a first operating voltage at said operating voltage terminal of said deflection amplifier which is approximately equal to said supply voltage and is coupled to said operating voltage terminal of said deflection amplifier when said capacitor is connected by said switch to ground through said resistor, and a second operating voltage which is greater than said first operating voltage and is coupled to said operating voltage terminal of said deflection amplifier when said capacitor is connected by said switch to said anode of said diode.

4,179,644

POWER TOOL SWITCH INCLUDING SPEED CONTROL

Louis J. Vassos, Park Ridge, Ill., assignor to Skil Corporation, Chicago, Ill.

Filed Jan. 10, 1978, Ser. No. 868,269
Int. Cl.[2] H05K *7/14*
U.S. Cl. 318—17 **14 Claims**



1. In a double pole, trigger actuated switch of the type contained within a housing and adapted for mounting within the casing of a power tool for selectively connecting and disconnecting both sides of a power source for the tool motor in response to movement of the trigger between extended and depressed positions, the improvements comprising:

(a) a first pair of contacts including a first fixed contact and an associated first movable contact for making and breaking one side of the power source for the tool motor;

(b) a second pair of contacts including a second fixed contact and an associated second movable contact for making and breaking the other side of the power source for the tool motor;

(c) means connecting said trigger with said first and second movable contacts for closing said first and second pairs of contacts sequentially such that the first pair of contacts is closed prior to closing of the second pair of contacts in response to movement of the trigger from its extended position to its depressed position and for opening said pairs of contacts in reverse order in response to movement of the trigger from its depressed position to its extended position;

(d) said connecting means including camming means for rapidly making and breaking engagement of the second pair of contacts in a snap-action manner to minimize arcing;

(e) a speed control circuit contained within the switch housing on a circuit board operatively connected to the trigger whereby the speed of the tool motor may be varied in response to the amount of trigger movement; and

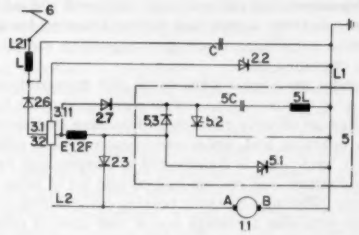
(f) a heat sink contained within said housing in intimate contact with said circuit board, said heat sink having a planar portion and an integral cooling fin in parallel spaced relation with said planar portion.

4,179,645

CIRCUIT FOR DRIVING AND BRAKING A SPEED-CONTROLLED DIRECT CURRENT MOTOR

Beat Wehrmüller, Hellbühl, Switzerland, and Paul Wienenga, Mannheim, Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Dec. 30, 1977, Ser. No. 865,892
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659514
Int. Cl.[2] H02P *3/12*
U.S. Cl. 318—139 **4 Claims**



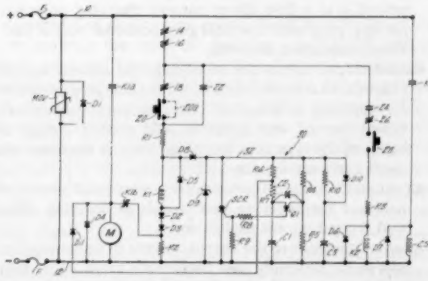
1. A circuit for the driving and braking of a speed-controlled direct current motor which is energized during driving operations by a direct current source by way of a choking coil and a direct current regulator that includes a quenching diode, especially for the drive of a vehicle, including a braking resistance and a first diode, connected in parallel with a field winding of the motor, a plurality of switching means to carry out the regrouping of the components from a driving to a braking operation, the field winding being in series with one of the switching means and during the driving operation being connected in shunt with the armature of the motor, the braking resistance being in series with one of the switching means and during the braking operation being connected in shunt with the armature of the motor, a second diode connected between the quenching diode of the direct current regulator and the braking resistance, a third diode connected during braking operations between one terminal of the field winding and one terminal of the choking coil, one terminal of the second diode being connected to the braking resistance at the connection of the braking resistor to the field winding.

4,179,646

CONTROL CIRCUIT FOR CIRCUIT BREAKER DC MOTOR OPERATOR

Ronald R. Russell, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 24, 1978, Ser. No. 889,755
Int. Cl.[2] H02P *3/12*
U.S. Cl. 318—380 **9 Claims**



1. A circuit for controlling a circuit breaker motor operator

mechanism in executing a breaker operating mechanism charging cycle, said control circuit comprising, in combination:

A. first and second buses for connection to a source of DC voltage;

B. a relay including

(1) an operating coil,

(2) a first set of normally open contacts, and

(3) a second set of normally closed contacts;

C. a DC motor connected in series with said first set of relay contacts across said first and second buses;

D. a dynamic braking resistor connected across said motor through said second set of relay contacts; and

E. means connecting said relay operating coil and said braking resistor in series across said first and second buses for the selective establishment of an energization circuit for said relay operating coil,

F. whereby upon establishment of said energization circuit, said relay is activated to initiate a charging cycle by closing said first set of relay contacts and opening said second set of relay contacts, and, upon interruption of said energization circuit, said relay is deactivated to reopen said first set of relay contacts and reclose said second set of relay contacts thereby initiating a dynamic braking cycle during which said motor generates a voltage across said braking resistor of a polarity to prevent the effective re-establishment of said energization circuit for said relay operating coil until said braking cycle has been substantially completed.

4,179,647

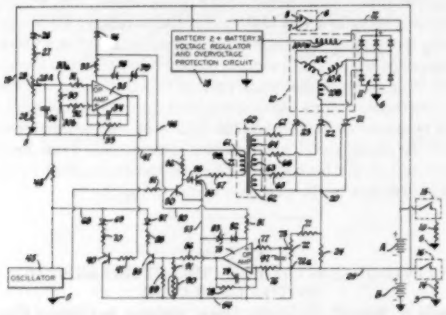
DUAL OUTPUT BATTERY CHARGING SYSTEM

Donald L. Cummins, and Daniel W. Stahura, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1977, Ser. No. 856,642

Int. Cl.[2] H02J *7/14*

U.S. Cl. 320—6 **4 Claims**



1. A dual output battery charging system for supplying direct current charging potentials for two series connected storage batteries comprising:

means for producing an alternating current potential;

first circuit means for rectifying said alternating current potential to a first direct current charging potential and for applying said first charging potential across said two series connected batteries;

second circuit means for rectifying said alternating current potential to a second direct current charging potential and for applying said second charging potential across a selected one of said batteries, said second circuit means being of the type that is enabled only in response to electrical enabling signals;

an oscillator circuit for producing a series of electrical signals and for applying said signals as enabling signals to said second circuit means; and

means responsive to the output current of said second circuit means for disabling said oscillator circuit when said output current is greater than a predetermined maximum value whereby said second circuit means is disabled when said output current thereof is greater than said predetermined maximum value.

4,179,648

METHOD AND APPARATUS FOR RAPID BATTERY CHARGING

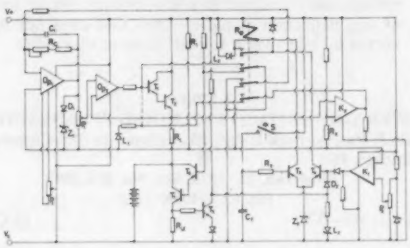
Per-Edward Samsioe, Edsviksvägen 138, 191 43 Sollentuna, Sweden

Filed Nov. 16, 1977, Ser. No. 851,820

Claims priority, application Sweden, Jan. 24, 1977, 7700703

Int. Cl.[2] H02J *7/04*

U.S. Cl. 320—11 **11 Claims**



1. A method of rapidly charging a battery having a known nominal amperage, comprising:

discharging the battery to a predetermined value to discharge a possible residual charge on the battery, and

automatically charging the battery with a charging current having a value which initially is greater than the value of the nominal battery amperage, decreasing said charging current from its initial value at an exponential rate determined by a resistor-capacitor discharge circuit, and decreasing said charging current to a value sufficiently less than the nominal battery amperage to prevent damage to the battery.

4,179,649

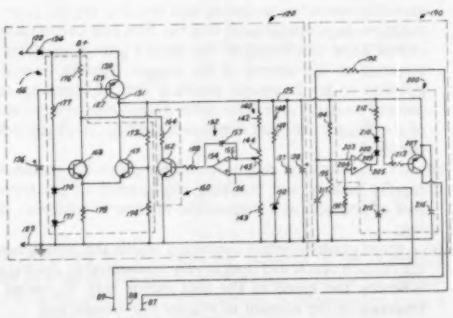
VOLTAGE SUPPLY APPARATUS POWERED FROM A VEHICULAR ELECTRICAL SYSTEM

Richard A. Karlin; Robert W. McDonald, both of Chicago, and Gary F. Comiskey, Evanston, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Division of Ser. No. 709,458, Jul. 28, 1976. This application Feb. 27, 1978, Ser. No. 881,421

Int. Cl.[2] G05F *1/56, 1/66;* **H02J** *7/00*

U.S. Cl. 320—13 **3 Claims**



1. Apparatus for supplying regulated DC voltage to circuitry powered by a vehicular electrical system comprising:

a rechargeable battery for the vehicle having a first terminal and a second terminal;

a voltage supply bus;

a series regulating transistor comprising a base element, an emitter element for receiving voltage from the first terminal of the battery, and a collector element for transmitting voltage to the supply bus;

first sampling means for generating a first sampling voltage proportional to the bus voltage on the supply bus;

reference means for establishing a reference voltage;

comparison means for comparing the first sampling voltage with the reference voltage and for generating a correction signal having a value proportional to the difference between the first sampling voltage and the reference voltage;

means for applying the correction signal to the base-emitter junction of the regulating transistor so that the emitter-collector junction impedance of said transistor provides a voltage drop sufficiently small to maintain the bus voltage at a regulated value under low-voltage battery conditions; and

a starting circuit for biasing the series regulating transistor to a conductive state when the apparatus initially is connected to the battery, said starting circuit comprising:

i. a first resistor operatively connected between the base and the emitter elements of the regulating transistor;

ii. first switch means operatively connected between the base element of the regulating transistor and the second terminal of the battery;

iii. means for establishing a predetermined switching voltage for biasing the first switch means into a conductive state in response to the connection of the battery to the apparatus, whereby the current is drawn through the first resistor so that the regulating transistor is biased to a conductive state;

iv. second sampling means for generating a second sampling voltage proportional to the supply bus voltage; and

v. second switch means operatively connected between the collector of the regulating transistor and the first switch means for switching the first switch means to a non-conductive state when the second sampling voltage attains a predetermined relationship with respect to the predetermined switching voltage.

4,179,650

VARIABLE IMPEDANCE CIRCUITS

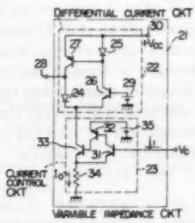
Isao Fukushima, Fujisawa; Akihiro Asada, Yokohama, and Kazuya Takahashi, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 27, 1977, Ser. No. 864,266

Claims priority, application Japan, Dec. 27, 1976, 51-156537

Int. Cl.[2] G05F *1/48*

U.S. Cl. 323—1 **7 Claims**



1. A variable impedance circuit, comprising:

a differential current circuit including a semi-conductor element having at least one PN-junction, a first transistor having a collector, a base, an emitter, an emitter-base junction and a collector-base junction with said emitter-base junction being connected to said PN-junction of said semiconductor element with opposite polarities relative to each other, a current supply means for supplying current to the connection between said PN-junction and said base-emitter junction therethrough, and an impedance terminal connected to said PN-junction at the side opposite to the connection to said emitter-base junction;

a current control circuit including a resistor, a second transistor having a base, a collector connected to said connection between said emitter-base junction of said first transistor and said PN-junction of said semiconductor element and an emitter grounded through said resistor, a third transistor of same conduction type as that of said second transistor having a base adapted to be applied with a control voltage, an emitter connected to the emitter of said second transistor and a collector connected to a fourth transistor of a conduction type opposite to that of said second and third transistors, said fourth transistor having a collector connected to the base of said second transistor, a base connected to said collector of said third transistor and an emitter, wherein current flowing through said second transistor is adapted to control current flowing through said differential current circuit.

wherein impedance at said impedance terminal is given by an operating resistance determined by a current flowing through said PN-junction of said semiconductor element and a current flowing said emitter-base junction of said first transistor, and

wherein said emitter of said fourth transistor is actuated with a voltage from a first power source which is electrically isolated from said differential current circuit to provide a high impedance to said current control circuit as seen by said differential current circuit.

4,179,651

METHOD AND APPARATUS FOR SUPERVISING AN ELECTRICAL LINE FOR SHORT CIRCUITS

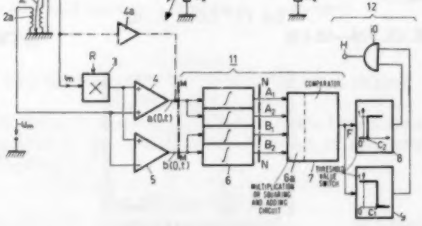
Michael Vitins, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Switzerland

Filed Sep. 22, 1977, Ser. No. 835,852

Claims priority, application Switzerland, Sep. 30, 1976, 12360/76

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—51 **14 Claims**

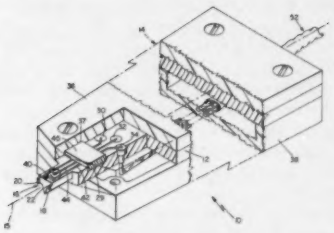


1. A method of supervising an electrical line for short circuits, comprising the steps of: deriving current and voltage signals (i_m and u_m) from line current and line voltage at a measuring point (x=0), modifying relatively the current and voltage signals by multiplying at least one of these signals by a modifying factor (R or 1R) which is at least approximately free of phase rotation, forming at least one auxiliary signal (a or b) corresponding to the sum or difference in each case of a pair of relatively modified current and voltage signals ($R.i_m$, u_m and i_m, u_m/R), performing an amplitude comparsion between said auxiliary signal (a, b) and a reference signal (i_m or a), and generating a short-circuit signal (H) upon exceeding at least one predetermined limiting value (C_1, C_2) for the difference of the compared signals, or for a comparsion signal (F) generated during amplitude comparsion.

4,179,652
ANALYZING ELECTRICAL CIRCUIT BOARDS

Richard P. Davis, Carlisle, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Feb. 21, 1978, Ser. No. 879,881
Int. Cl.[2] G01R *27/14*
U.S. Cl. 324—64 **5 Claims**



1. Apparatus for analyzing electrical circuit boards, comprising

a probe having first, second, and third contact tips,

said second and third tips being close enough to each other to simultaneously contact a conductive lead of an integrated circuit element mounted on said board, but spaced apart from each other sufficiently to permit measurement of electrical activity in the lead segment between said second and third tips,

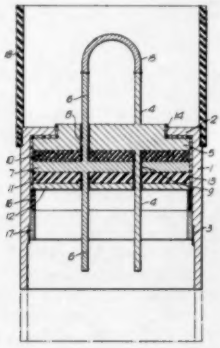
a test signal source for injecting said test signal into said lead through said first tip, and

measurement means for measuring the voltage drop between said second and third tips resulting from the flow of test current through the resistance of said lead segment, said measurement means being sensitive enough to detect voltage differences as small as 10 microvolts.

4,179,653
CORROSION MONITORING PROBE

Michael Davies; Glyn Hourihan, and Frank Smith, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1978, Ser. No. 880,305
Claims priority, application United Kingdom, Mar. 3, 1977, 9000/77
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—65 CR **12 Claims**



1. A corrosion monitoring probe comprising

an elongated tubular body member having an annular lip at an upper end thereof;

a probe element comprising at least two metallic discs, each disc having a pin above and below the plane of the disc and at least one channel through the disc, the discs being positioned one on top of the other so that the pins of a particular disc pass through a channel in an adjacent disc;

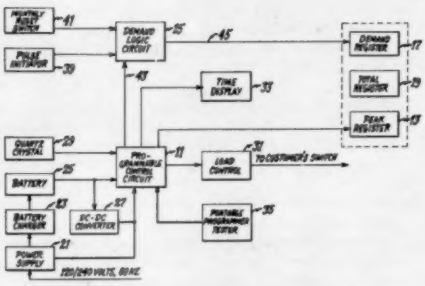
a seal comprising at least one gasket in the form of a channelled disc of an electrically insulating material, positioned between adjacent metallic discs, and an annular gasket of an electrically insulating material positioned between the upper metallic disc and the lip of the body member; and

means for compressing the channelled disc and the annular gasket so as to effect a seal.

4,179,654
DEMAND METER INCLUDING MEANS FOR SELECTIVELY CONTROLLING THE LENGTH OF DEMAND INTERVALS

Warren R. Germer, Rochester, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Feb. 27, 1978, Ser. No. 881,741
Int. Cl.[2] G01R *15/08, 11/64;* G06F *15/20*
U.S. Cl. 324—116 **3 Claims**



1. In a programmable time-of-day demand meter of the type including a control circuit for generating a control signal at prescribed intervals to enable a demand logic circuit of said meter to control the engagement and disengagement of a demand register of said meter during demand intervals, apparatus for selectively controlling the length of said demand intervals comprising:

(a) counter means for counting said control signal at each prescribed interval, said counter means having output terminals, each capable of providing, as an output, an end of interval signal representative of the length of a demand interval in accordance with the count in said counter means; and

(b) means adapted to selectively connect any one of the output terminals of said counter means to said demand logic circuit to provide an end of interval signal thereto to enable said demand logic circuit to disengage said demand register to terminate a demand interval at a time determined by the length of time it takes said counter means to accumulate a count which effects the generation of the end of interval signal at the selected output terminal connected to said demand logic circuit.

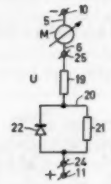
4,179,655
MOVING COIL INSTRUMENT WITH LINEAR CHARACTERISTIC

Peter M. J. Peeters, Herts, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 15, 1977, Ser. No. 816,000
Claims priority, application Netherlands, Aug. 2, 1976, 7608559
Int. Cl.[2] G01R *15/10, 19/22*
U.S. Cl. 324—132 **12 Claims**

1. A moving coil instrument provided with a linear deflection characteristic comprising, a magnet core and a yoke with

an air gap to accommodate a rotatable coil, a coil rotatable about an axis and located within the yoke air gap, a non-linear relationship normally existing between the angular rotation of the coil and a direct current flowing in the coil in response to a DC electric quantity applied to the instrument, means for correcting said non-linear relationship comprising a diode-resistor network having two input terminals, means for applying the DC electric quantity to said two input terminals, said diode-resistor network comprising a first branch circuit including a first resistor connected in series with a first parallel circuit



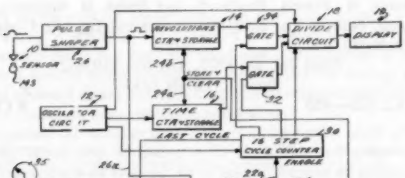
that includes a second resistor in parallel with at least one first diode connected in the forward direction relative to the DC electric quantity applied to said two input terminals and, in parallel with the first diode, a series connection of a third resistor and a second diode whose forward direction is reversed relative to that of the first diode, and means coupling the coil to the diode-resistor network so that the DC current distribution among the network elements and the coil produces an angular rotation of the coil which is a substantially linear function of the DC electric quantity.

4,179,656

DETERMINATION OF AVERAGE SPEED OF ROTATION OF A CYCLICALLY LOADED SHAFT DURING PERIODS OF UP TO TWO MINUTES DURATION

Raymond L. Wagner, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 6, 1978, Ser. No. 875,578
Int. Cl.[2] G01P *11/00*
U.S. Cl. 324—166 **17 Claims**



5. An electronic tachometer for determining average speeds of rotating cyclically loaded shafts, comprising

means for sensing each revolution of a rotating shaft,

means for electronically counting and storing the number of revolutions of the shaft,

means for electronically generating a highly time-regular pulse stream,

means for counting and storing the number of pulses in the highly time-regular pulse stream over a given time span simultaneously with the counting of the number of shaft revolutions,

means for controlling the given time span so that it is adjustable to a time span within the range of 2 to about 120 seconds,

means for electronically dividing the number of revolution pulses counted by the number of time pulses counted during the given time span to determine the shaft average speed, and

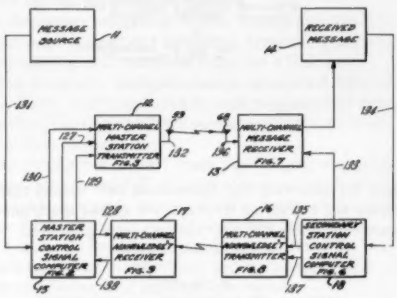
means for digitally displaying the average speed determined.

4,179,657

ANTI-JAMMING COMMUNICATION SYSTEM

Charles F. Hobbs, Medford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1958, Ser. No. 757,885
Int. Cl.[2] H04K *1/00*; H04L *9/00*
U.S. Cl. 325—33 **6 Claims**



1. A system of communications to an intended destination in a manner to elude detection by unauthorized sources, and to prevent jamming, which comprises multi-channel transmitting means, each of said channel and transmitting means having a different frequency and delay, said frequency and delay being variable, means to generate time and address digits, means to encipher said time and address digits, means to initially set the frequencies and delays in each of said transmitting channels, said setting means receiving said enciphered time and address digits, means to convert a message to be transmitted into digital bits, means to encipher said message digital bits, means for multiple transmission of the initial message digital bit after said setting of channels, and means to successively reset the frequency and delay in each of said transmitting channels after said multiple transmission of said first message digital bit, said resetting means receiving successive enciphered message digital bits until said message is completely transmitted.

4,179,658

SECRET-SIGNALLING SYSTEM UTILIZING NOISE COMMUNICATION

David R. Bitzer, Hyattsville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 23, 1968, Ser. No. 755,010
Int. Cl.[2] H04K *1/00*
U.S. Cl. 325—34 **18 Claims**

1. In a secret-signalling system, the combination comprising:

an information signal source;

a reference signal source, the reference signal being a noise signal;

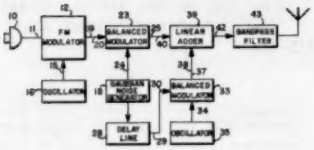
means for providing a first suppressed-carrier signal from the information signal, the first suppressed carrier providing means being connected to the information signal source and the reference signal source, the reference signal being the carrier signal;

means for providing a delayed reference signal from the reference signal;

means for combining the delayed reference signal with the first suppressed carrier information signal to yield at least one first spread spectrum signal of the information signal in combination with the reference signal;

means for selecting the desired first spread spectrum signal

to be transmitted to yield a desired secret signal which is to be transmitted; and



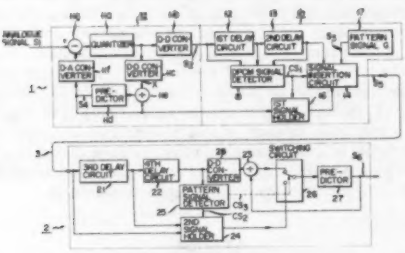
means for receiving the transmitted first spread spectrum signal and extracting from the first spread spectrum signal received, solely the information signal generated.

4,179,659

SIGNAL TRANSMISSION SYSTEM

Isao Tashiro, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 22, 1977, Ser. No. 863,178
Claims priority, application Japan, Dec. 25, 1976, 51/156960
Int. Cl.[2] H03K *13/22*
U.S. Cl. 325—38 B **8 Claims**



1. A signal transmission system which comprises:

input signal-coding means for sampling an input signal at a prescribed sampling period and converting said sampled data into a predictive signal train and a differential pulse code modulated (DPCM) signal train, each signal train including the information of said input signal;

transmission signal train-forming means coupled to said input signal-coding means and which is supplied with said DPCM signal train and said predictive signal train, and including means, when, a specified group of adjacent words included in said DPCM signal train is detected to have prescribed contents, for replacing the specified group of adjacent words by a specified pattern signal never applied as a DPCM signal and a predictive signal, thereby forming a transmission signal train to be transmitted; and

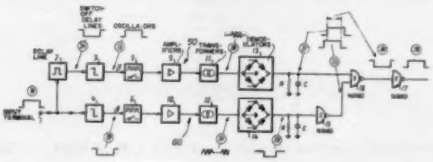
predictive signal train-reproducing means for receiving the transmitted transmission signal train and detecting said specified pattern signal in said received transmission signal train and inserting said transmitted predictive signal into the respective positions of said adjacent words, thereby reproducing said predictive signal train previously produced by said input signal-coding means out of said received transmission signal train.

4,179,660

METHOD AND DEVICE FOR TRANSMITTING PULSE-DURATION MODULATED SIGNALS USING TWO OSCILLATORS

Jürgen Zeis, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,935
Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721993
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—59 **11 Claims**



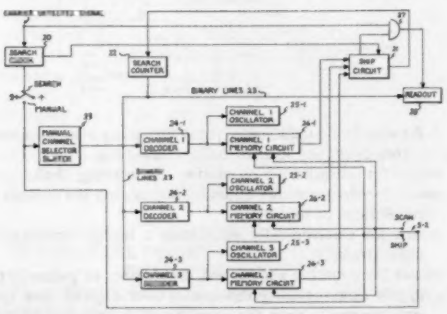
11. A method for transmitting a pulse duration modulated signal having a switch-on and switch-off edge comprising delaying the switch-on edge of a pulse in the signal, using the delayed switch-on edge of the pulse to start a first oscillator and generate a first carrier frequency pulse train, delaying the switch-off edge of a pulse in the signal, using the delayed switch-off pulse to start a second oscillator and generate a second carrier frequency pulse train, said first carrier frequency pulse train being switched off by a delayed switch-off edge of a pulse in the signal whereby the switch-off of said first carrier frequency pulse train is separated in time from the switch-on of said second carrier frequency pulse train, comparing the switch-on of said first and second carrier frequency pulse trains to reconstitute the pulse duration modulated signal.

4,179,661

CIRCUIT FOR PROGRAMMING THE SEARCH CIRCUIT OF A RADIO RECEIVER

Raymond W. Harris, Rustburg, and Ralph R. Sherman, Jr., Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jul. 28, 1977, Ser. No. 819,862
Int. Cl.[2] H04B *1/32*
U.S. Cl. 325—455 **8 Claims**



1. An improved circuit for selectively programming a search circuit of a radio receiver comprising:

a. a first manual switch for energizing said search circuit in one state and for energizing said improved circuit in a second state;

b. channel decoder means connected to said search circuit;

c. a manual channel selector switch connected between said first switch and said channel decoder means, said manual channel selector switch being energized in response to said first switch being in said second state, and said manual channel selector switch having a plurality of positions, each of which produces a distinct predetermined channel signal;

d. memory means connected to said decoder means and to said search circuit;

e. and a second manual switch connected between said first switch and said memory means, said second manual switch being energized in response to said first switch being in said second state, and said second manual switch having a scan state and a skip state for selectively programming said memory means in response to said memory means being activated by a respective channel signal.

4,179,662

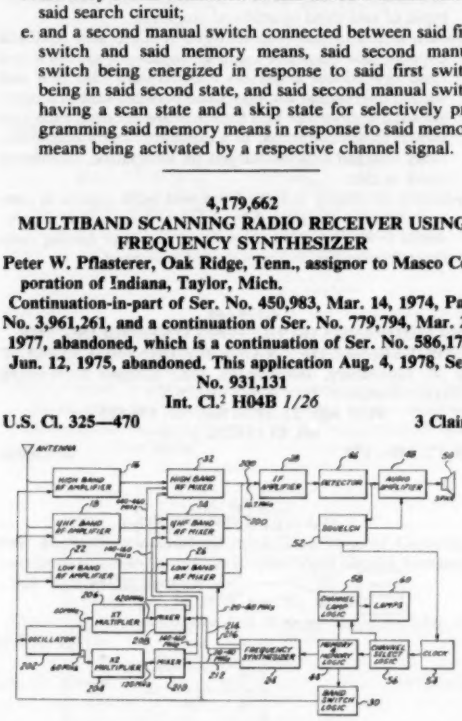
MULTIBAND SCANNING RADIO RECEIVER USING FREQUENCY SYNTHESIZER

Peter W. Pflasterer, Oak Ridge, Tenn., assignor to Masco Corporation of Indiana, Taylor, Mich.

Continuation-in-part of Ser. No. 450,983, Mar. 14, 1974, Pat. No. 3,961,261, and a continuation of Ser. No. 779,794, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 586,178, Jun. 12, 1975, abandoned. This application Aug. 4, 1978, Ser. No. 931,131

Int. Cl.[2] H04B *1/26*

U.S. Cl. 325—470 **3 Claims**



1. A signal seeking receiver for automatically scanning and monitoring a plurality of channels of predetermined radio frequencies lying in a low RF band and in a plurality of separate and spaced apart higher RF bands, and for tuning a received channel signal having a frequency corresponding to one of said channels, said receiver comprising:

a separate RF section uniquely associated with each of said RF bands and including a RF amplifier and a RF band mixer, each of said RF band mixers having an output;

band switch logic means for producing a band logic signal indicating that a channel being scanned is within a particular one of said RF bands for energizing only one of said RF sections corresponding to said band logic signal;

phase-locked-loop frequency synthesizing means responsive to a predetermined combination of input signals applied thereto for generating a synthesized frequency beating signal at an output of said frequency synthesizing means;

programmable memory means connected to said frequency synthesizing means for storing various preselected combinations of said input signals at predetermined addresses;

means for programming said memory means to enter said various preselected combinations of input signals at predetermined addresses in said memory means, said programming means including means for manually and separately producing each of said various combinations of signals;

means connected to said memory means for selectively addressing said memory means to thereby cause a selected combination of input signals to be applied to said frequency synthesizing means;

a first supplemental mixer connected between the output of said frequency synthesizing means and a first one of said RF band mixers;

a second supplemental mixer connected between the output of said frequency synthesizing means and a second one of said RF band mixers, a third one of said RF band mixers directly connected to the output of said frequency synthesizing means for receiving said synthesized frequency beating signal;

oscillator means responsive to said band logic signal for providing a substantially constant oscillator frequency signal to at least one of said supplemental mixers when said band signal indicates that the channel being scanned is within one of said RF bands corresponding to said first or said second supplemental mixer;

first frequency multiplier means connected between said oscillator means and said first supplemental mixer for multiplying said oscillator signal by a first factor;

second frequency multiplier means connected between said oscillator means and said second supplemental mixer for multiplying said oscillator signal by a factor different from said first factor;

means responsive to said band logic signal for energizing only one of said RF sections to tune a received channel signal and provide an intermediate signal at the output of the RF band mixer of said energized RF section;

an IF section directly connected in common to the output of each of said RF band mixers, and including an IF amplifier for amplifying said intermediate signal;

detector means coupled to said IF amplifier for producing an audio signal in response to said intermediate signal;

an audio amplifier connected to said detector means for driving an audio speaker with said audio signal; and

means for producing an inhibiting signal and for disabling said audio amplifier when a channel signal is not being received.

4,179,663

DEVICES FOR GENERATING PSEUDO-RANDOM SEQUENCES

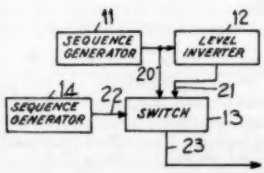
Jean-Pierre Vasseur, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 3, 1969, Ser. No. 813,178

Claims priority, application France, Apr. 10, 1968, 68.147660

Int. Cl.[2] H03K *1/00;* **H04L** *9/00*

U.S. Cl. 328—59 **4 Claims**



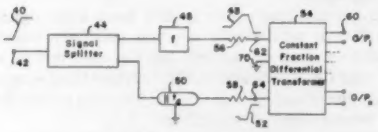
1. A device for delivering N′ pseudo-random sequences of digits in a system of base b, b being an integer greater than 1, and N′ being an integer, said device comprising: a sequence generator, having m outputs, for respectively delivering thereto m sequences of digits, referred to as primary sequences, m being an integer; p devices having respective inputs respectively coupled to p of said m outputs, for deriving from each one p of said primary sequences the (b−1) complementary sequences thereof, p being an integer smaller than m+1; a switch having m+p(b−1) inputs and N′ outputs for delivering said pseudo-random sequences; means for respectively applying said m primary sequences and said p(b−1) complementary sequences to said inputs of said switch; and a control system for connecting each output of said switch to one of the inputs thereof for each set of simultaneous digits respectively applied to the inputs thereof.

4,179,664

CONSTANT FRACTION SIGNAL SHAPING APPARATUS

Michael O. Bedwell, Concord, Tenn., assignor to Ortec Incorporated, Oak Ridge, Tenn.

Filed Jul. 26, 1977, Ser. No. 819,211
Int. Cl.[2] H03K 5/153
U.S. Cl. 328—150 5 Claims



1. An electronic circuit for generating a constant-fraction bipolar output signal related in time to the occurrence of an event identified with an input trigger signal, comprising:

input circuit means for splitting said input trigger signal into a first and second component;

first means connected to said input circuit means for attenuating the first component of said input trigger signal;

second means connected to said input circuit means for delaying the second component of said input trigger signal;

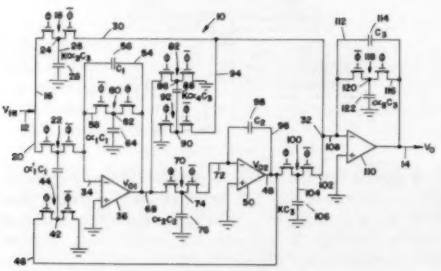
passive means having first and second terminals connected to said respective first and second means for inverting said second component and summing the first component with the second inverted component of said input signal applied thereto and generating a constant-fraction bipolar timing signal at the output of said passive means, said timing signal being accurately correlated with the time of occurrence of said event regardless of the shape and amplitude of the input signal, said passive means including a differential transformer having first and second primary windings respectively connected to said first and second terminals of said passive means and said first primary winding being wound to have opposite polarity relative to said second primary winding.

4,179,665

SWITCHED CAPACITOR ELLIPTIC FILTER

Roubik Gregorian, Sunnyvale, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Sep. 8, 1978, Ser. No. 940,473
Int. Cl.[2] H03F 1/36
U.S. Cl. 330—107 5 Claims



1. An electronic filter comprising:

an input terminal means adapted for connection with an input voltage source to be filtered;

a first integrating operational amplifier having a capacitor feedback means and an input connected to said input terminal means;

a second integrating operational amplifier connected to the output of said first operational amplifier;

a third integrating operational amplifier having a capacitor feedback means and connected to the output of said second operational amplifier;

a negative feedback connection between the output of said second operational amplifier and the input to said first operational amplifier;

a feed forward connection between said input terminal means, the output of said first operational amplifier and the output of said second operational amplifier and the input of said third operational amplifier;

switch means in said feed forward conduit, said feedback conduit, said capacitor feedback means for said first and third operational amplifiers and between said first and second operational amplifiers and between said first operational amplifier and said feed forward conduit, each said switch means connected to a capacitor which is continuously charged and discharged on alternative, successive clock cycles;

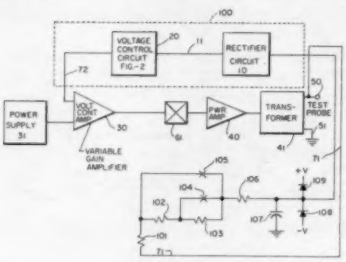
whereby an analog voltage from said input source is converted into a sampled data signal and an output is produced from said third operational amplifier having only those frequencies in a preselected pass band.

4,179,666

METHOD AND CIRCUIT FOR CONTROLLING THE OUTPUT SIGNAL OF A VARIABLE CONTROL CIRCUIT

Jon M. Lindenborg, Indianapolis, Ind., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,563
Int. Cl.[2] H03G 3/20
U.S. Cl. 330—138 13 Claims



1. A method for controlling the output voltage of a variable voltage generating circuit comprising the steps of:

determining whether the output voltage falls within a predetermined range of voltages, and

charging a capacitor, interconnected with an input of the variable voltage generating circuit, when the output voltage falls within the predetermined range of voltages, so as to control the output voltage in response to the charge on the capacitor.

4,179,667

CIRCUIT ARRANGEMENT FOR ADJUSTING THE VOLUME OF AN AUTOMOBILE RADIO RECEIVER IN DEPENDENCE ON ROAD NOISE

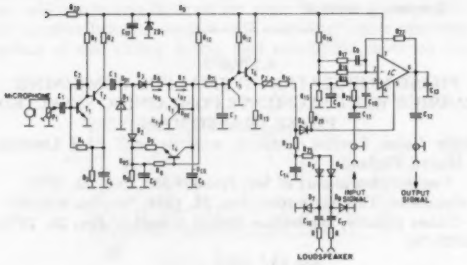
Peter Böttcher, Tannenbergalee 4C, D-3000 Hanover 1, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,835
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703249
Int. Cl.[2] H03F 1/26
U.S. Cl. 330—149 7 Claims

1. A circuit arrangement for adjusting the volume of an automobile radio receiver in dependence on road noise, comprising;

microphone means for picking up noise and responsively producing an electrical signal having a magnitude value representative of the magnitude level of the noise;

amplifier means for amplifying said electrical signal;
rectifying means for rectifying the amplified signal;
time-controlled circuit means responsive to the rectified signal for producing a time-dependent signal advancing in magnitude toward the instantaneous magnitude value of said rectified signal at a substantially linear rate, said time-controlled circuit means maintaining the magnitude of



said time-dependent signal when the magnitude of said time-dependent signal equals the magnitude value of said rectified signal and
control means positioned in the low frequency channel of the receiver for controlling the volume of the receiver, said control means responsive to the magnitude of said time-dependent signal.

4,179,668

HF-AMPLIFIER CIRCUIT

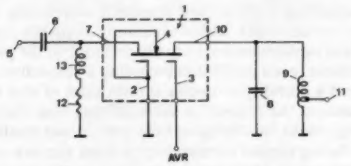
Josef H. Schuermann, Oberhummel, Fed. Rep. of Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Fed. Rep. of Germany

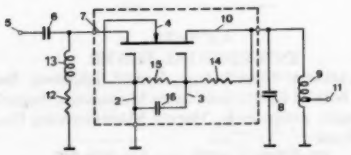
Filed Feb. 24, 1978, Ser. No. 881,105

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709314

Int. Cl.[2] H03F *3/16*

U.S. Cl. 330—277 **18 Claims**





1. A high frequency amplifier circuit comprising a gated field effect transistor including a semiconductor substrate incorporating source and drain regions having respective source and drain electrodes, a channel region interposed between said source and drain regions, two gate electrode means disposed between the source electrode and the drain electrode for electrical cooperation with the channel region to control current carrier flow between the source and drain regions, wherein said substrate is connected by direct connection means solely to one of said gate electrodes, input means coupled to said source electrode for application of high frequency input signals to said source electrode, output means coupled to said drain electrode for deriving output signals from said drain electrode, means for coupling a control voltage at least to the other one of said gate electrodes; and bias resistor means having one terminal connected to said source electrode and a further terminal connected with said one gate electrode means to a common potential.

4,179,669

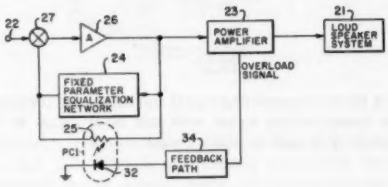
AMPLIFYING AND EQUALIZING

George B. Dodson, Framingham, and John A. Nangeroni, Newton, both of Mass., assignors to Bose Corporation, Framingham, Mass.

Filed Jun. 5, 1978, Ser. No. 912,334

Int. Cl.[2] H03G *5/28*

U.S. Cl. 330—282 **11 Claims**



1. In a power amplifying system having power amplifying means energizing loudspeaker means and active equalizing means responsive to an input audio signal for providing an equalized audio signal to said power amplifying means for rendering more uniform the radiated sound power response of said system, the improvement comprising,
variable gain means responsive to a feedback signal from said power amplifying means for altering the gain of said system in at least one predetermined frequency range relative to that of another,
means responsive to said power amplifying means beginning to overload for providing said feedback signal only when said power amplifying means overloads,
and means for coupling said feedback signal from said power amplifying means to said variable gain means to alter the relative gain to prevent audible overloading of said amplifying means in response to spectral components of said input audio signal in said predetermined frequency range.

4,179,670

FREQUENCY SYNTHESIZER WITH FRACTIONAL DIVISION RATIO AND JITTER COMPENSATION

Nicholas G. Kingsbury, Portsmouth, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jan. 27, 1978, Ser. No. 872,828

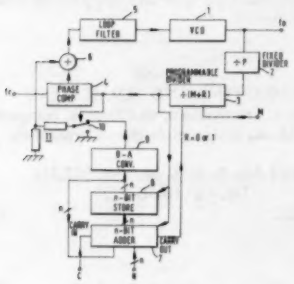
Claims priority, application United Kingdom, Feb. 2, 1977, 4204/77

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—10 **7 Claims**

1. A frequency synthesizer including a feedback loop comprising a controllable oscillator, a frequency divider, said frequency divider having an integral dividing factor, a phase comparator, the output of said oscillator being divided by said frequency divider and applied to said phase comparator for comparison with a reference signal, and the frequency of said oscillator being controlled by an error signal from said phase comparator, the synthesizer further including a digital store for accumulating a periodically occurring first quantity, means responsive to the accumulated sum of said first quantity to change said integral dividing factor by an integer when the content of said store reaches a predetermined second quantity, to produce, on average, a non-integral relation between the

oscillator frequency and the reference frequency, a digital-/analogue converter for converting the content of said store



into a jitter compensating signal and means for combining said jitter compensating signal with said error signal to suppress phase jitter in said oscillator output signal.

4,179,671

CAPACITOR SWITCHING CIRCUITS FOR ADJUSTING CRYSTAL OSCILLATOR FREQUENCY

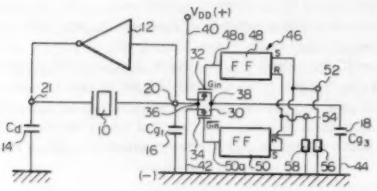
Hirohiko Yoshida, Hoya, and Fumio Nakajima, Tokyo, both of Japan, assignors to Citizen Watch Company Limited, Japan

Filed Jan. 3, 1978, Ser. No. 866,420

Claims priority, application Japan, Jan. 10, 1977, 52-841; Jan. 12, 1977, 52-2151

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 FE **1 Claim**



1. A piezo-electric oscillator comprising:

a quartz crystal having input and output terminals;

an inverting amplifier connected across the input and output terminals of said quartz crystal;

a first capacitor normally connected to the input terminal of said quartz crystal;

a second capacitor; and

electronic switching means connected between said input terminal of said quartz crystal and said second capacitor for controlling connection of said second capacitor relative to the input terminal of said quartz crystal for thereby adjusting an operating frequency of said quartz crystal to a prescribed value, said electronic switching means comprising a transmission gate having first and second control gate terminals, a first resistor, said first control gate terminal of said transmission gate being connected to the positive side of a power supply through said first resistor, a second resistor, said second control gate terminal of said transmission gate being connected to the negative side of said power supply through said second resistor, a first lead connecting said first control gate terminal directly to the negative side of said power supply, a second lead connecting said second control gate terminal directly to the positive side of said power supply, whereby said transmission gate is nonconductive to interrupt connection between the input terminal of said quartz crystal and said second capacitor, and said first and second leads being cut by a laser trimming to allow said transmission gate to turn on for thereby connecting said second capacitor to the input terminal of said quartz crystal to adjust the operating frequency thereof.

4,179,672

PHASE MODULATION SYSTEM FOR COMBINING CARRIER WAVE SEGMENTS CONTAINING SELECTED PHASE TRANSITIONS

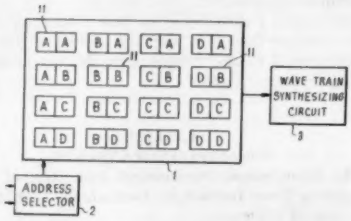
Roger Voles, London, England, assignor to E M I Limited, Hayes, England

Continuation-in-part of Ser. No. 809,365, Jun. 23, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 919,907

Claims priority, application United Kingdom, Jun. 26, 1976, 26729/76

Int. Cl.² H04L *27/20*

U.S. Cl. 332—16 R **6 Claims**



1. Signalling apparatus for producing a wave train which maintains one of a plurality of predetermined phase positions representing respective symbols during symbol transmitting periods, and which changes from one to another of said phase positions only during short transition periods between said symbol transmitting periods, said apparatus comprising waveform source means which makes separately available a plurality of different oscillations respectively defining all the possible phase transitions, each oscillation including a respective phase transition and a plurality of cycles at both sides of that transition the phases at the respective sides defining that transition, and selecting means for changing from one of said oscillations to another during symbol transmitting periods, the two oscillations between which changing occurs being in the same phase position while changing occurs and the second oscillation undergoing the desired phase transition during the next transition period.

4,179,673

INTERDIGITAL FILTER

Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa; Sadahiro Tamura, both of Kyoto, and Haruo Matsumoto, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Feb. 9, 1978, Ser. No. 876,247

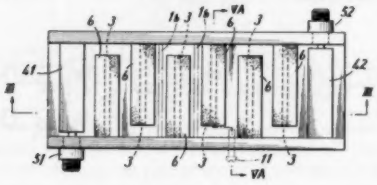
Claims priority, application Japan, Feb. 14, 1977, 52/15204; Jul. 6, 1977, 52/81429

Int. Cl.² H01P *1/20*

U.S. Cl. 333—204 **11 Claims**

1. An interdigital filter, comprising casing means of an electrically conductive material said casing means having an inner upper and an inner lower opposing surface, a plurality of dielectric resonator means protruding inwardly from each of the side surfaces of said casing means, said plurality of resonator means being interdigitally arranged relative to each other

and extending in a direction perpendicular to said side surfaces, each of said plurality of resonator means comprising a core resonant conductor member and a solid dielectric member disposed to continuously enclose said core resonant conductor member along substantially the entire length of said member, each of said solid dielectric members which comprise each of said plurality of resonator means having a conductive layer formed on the upper surface of said solid dielectric member and formed on the lower surface of said solid dielectric member, said conductive layer on the upper surface of said dielectric member being in contact with said inner upper opposing surface of said casing means, said conductive layer on the



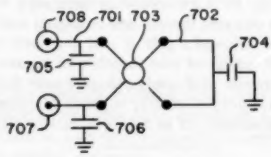
lower surface of said dielectric member being in contact with said inner lower opposing surface of said casing means, the adjacent resonator means being coupled in the even and odd modes of the transverse electromagnetic wave, the coupling of said adjacent resonator means causing the ratio of the characteristic impedance in the odd mode to the characteristic impedance in the even mode of said resonator means to increase, a further dielectric portion having a lower dielectric constant relative to the dielectric constant of said solid dielectric member being formed between adjacent ones of said plurality of resonator means, said resonator means being further connected to an input and an output connector means.

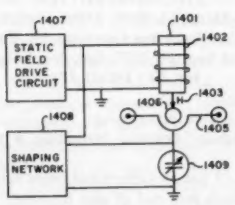
4,179,674

COMPACT RF STRUCTURE FOR NONRECIPROCAL FERROMAGNETIC RESONANCE COUPLING

William J. Keane, and John A. Mezak, both of San Jose, Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 5, 1978, Ser. No. 966,743
Int. Cl.[2] H01P *1/20, 3/08, 3/06*
U.S. Cl. 333—204 **12 Claims**





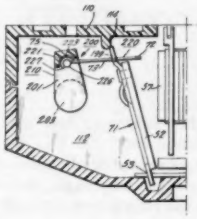
1. A ferromagnetic resonant device of the type in which a ferromagnetic resonant material is subjected to a static magnetic field, coupling to the ferromagnetic material is provided by two lines in proximity to said material, and the currents in said lines have a generally orthogonal phase relationship, characterized in that said orthogonal phase relationship is produced in part by a capacitive reactance coupled to one of said lines and said material is offset from the plane of said lines.

4,179,675

TRIP BAR MEANS SUBASSEMBLY

Norman P. Perkins, Jr., Westminster, Md., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 3, 1978, Ser. No. 893,205
Int. Cl.[2] H01H *75/00, 77/00*
U.S. Cl. 335—9 **10 Claims**



1. A multipole circuit breaker including cooperating contact means for each pole thereof; an operating mechanism operatively connected to said contact means; latch means for maintaining a releasable portion of said operating mechanism in a reset position wherein said operating means is effective to close said contact means; an automatic trip means including an individual overload sensing means for each of said poles; said automatic trip means including a common trip bar means comprising an elongated element including first means defining a pivot axis for said trip bar means, an elongated bar having its longitudinal axis generally parallel to and laterally offset from said pivot axis, and second means operatively connected to said latch means; said automatic trip means also including an extension unit and pin means pivotally connecting said extension unit to said bar at a pivotal axis generally parallel to the pivot axis; said extension unit including an elongated main section having its longitudinal axis generally parallel to said pivotal axis; said extension unit also including third means for each of said poles spaced along the length of said main section and extending laterally therefrom into operative engagement with said automatic trip means whereby operation of the latter is effective to pivot said trip bar means about said pivot axis causing said second means to trip said latch means to release said portion whereby said operating mechanism opens said contact means.

4,179,676

TIME DELAY RELAY MOVEMENT

George J. Selas, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 12, 1978, Ser. No. 895,547
Int. Cl.[2] H01H *7/00, 43/02, 7/03*
U.S. Cl. 335—59 **16 Claims**

1. In a relay movement for actuating switch contacts, the combination comprising:

an elongated operating plunger longitudinally movable in forward and backward strokes;

a contact actuator reciprocably movable along said plunger with a pair of spaced spring stops disposed longitudinally of said plunger and adapted to be coupled to said switch contacts to operate the same;

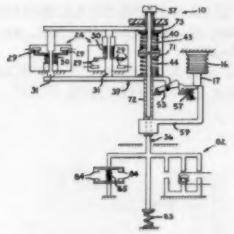
a pair of springs disposed between said spring stops;

spring-stressing means, carried by said plunger between said springs, for loading one of said springs to apply a force against one of said spring stops on a forward stroke of said plunger, and for loading the other of said springs to apply

a spring force against the other of said spring stops on a backward stroke of said plunger;

catch means;

a latch coupled to said actuator for movement therewith, said latch being restricted by said catch means upon a



movement of the plunger to load one of said springs against said actuator; and

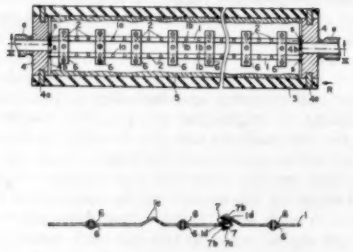
a timer adapted to move said catch means after a time delay from the movement of said plunger, thereby releasing said latch to actuate the switch contacts with spring action.

4,179,677

COMBINATION OF FUSIBLE ELEMENTS FOR ELECTRIC FUSES

Frederick J. Kozacka, South Hampton, N.H., and Richard J. Perreault, Amesbury, Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 15, 1978, Ser. No. 905,960
Int. Cl.[2] H01H *85/12*
U.S. Cl. 337—161 **4 Claims**



1. A combination of fusible elements for electric fuses comprising

(a) a plurality of parallel ribbon-type fusible elements, the preponderant portion of the length of said plurality of fusible elements being arranged in a common plane;

(b) each of said plurality of fusible elements having a plurality of serially arranged points of reduced cross-sectional area;

(c) said plurality of points of reduced cross-sectional area each consisting of a perforation and a pair of current paths each to opposite sides of said perforation;

(d) a plurality of separate pairs of electric insulating members arranged transversely to said plurality of fusible elements and extending across said plurality of fusible elements, each of said pairs of electric insulating members sandwiching said plurality of fusible elements at at least two points of reduced cross-sectional area of said plurality of points of reduced cross-sectional area;

(e) said plurality of pairs of electric insulating members consisting of a laminate of glass-cloth and synthetic resin;

(f) said plurality of pairs of electric insulating members being non-interconnected by any insulating or conductive structure; and

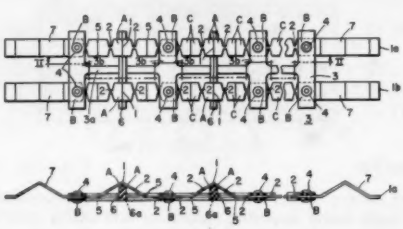
(g) fastener means projecting through each of said plurality of pairs of electric insulating members to firmly position the same relative to said plurality of fusible elements.

4,179,678

ELECTRIC FUSE WITH GAS EVOLVING MATERIALS

Richard Perreault, Amesbury, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 7, 1978, Ser. No. 894,594
Int. Cl.[2] H01H *85/12*
U.S. Cl. 337—293 **7 Claims**



1. Fusible elements and a support therefor comprising

(a) a pair of parallel fusible ribbon elements each including a plurality of fusible element sections and a plurality of points of reduced cross-section;

(b) said plurality of fusible element sections of each of said pair of fusible elements including angularly bent sections having a point of reduced cross-section arranged in spaced relation from the edge formed by said angular bent, and said plurality of fusible element sections of each of said fusible elements further including non-bent planar sections;

(c) a support of electric insulating material for said pair of fusible elements, said support including a portion arranged between said pair of fusible elements and extending in a direction longitudinally thereof, and said support further including transverse arms arranged to both sides of said portion of said support extending in a direction longitudinally of said fusible elements, said arms sandwiching said planar sections and supporting said planar sections; and

(d) a member of a gas-evolving substance being wedge-shaped on one side thereof and engaging with said wedge-shaped side thereof a pair of said angularly bent sections, the center region of said member of a gas-evolving substance opposite said wedge-shaped side thereof abutting against said portion of said support extending in a direction longitudinally of said pair of fusible elements.

4,179,679

THERMAL SWITCH

Stephen E. Houghland, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 19, 1978, Ser. No. 943,691
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—407 **8 Claims**

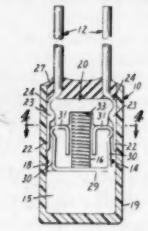
1. A thermal switch comprising:

a thin rectangular housing providing a thin rectangular cavity,

a pair of spaced parallel electrical leads extending into said cavity through one end of said housing,

a contact spring formed from a flat strip of metal, said contact spring having a U shape with inward extensions from the ends of legs of the U, the outside face of each of the legs of the U normally resiliently contacting one of said leads spaced from the end thereof to electrically connect said leads through said contact spring, said

contact spring being movable in said cavity away from said one end of said housing to move the legs thereof out of contact with said leads, said inward extensions of said contact spring defining with the side walls and said one end of said housing a compression spring pocket,



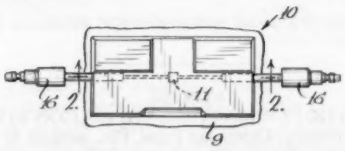
a fusible pellet in said cavity at the end of said housing opposite said one end, said pellet extending between said opposite end and the base of the U of said contact spring to support said contact spring in its normal position with the legs thereof contacting said leads, and

a compression spring in said pocket urging said contact spring against said pellet.

4,179,680
TEMPERATURE SENSOR

Otfried W. G. Heybey, Niles, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 3, 1977, Ser. No. 848,241
Int. Cl.[2] H01C 7/04
U.S. Cl. 338—25 **10 Claims**



1. a thermally responsive integrating sensor assembly for use in providing a delayed warning signal indicating a sensed high temperature condition, said sensor assembly comprising:

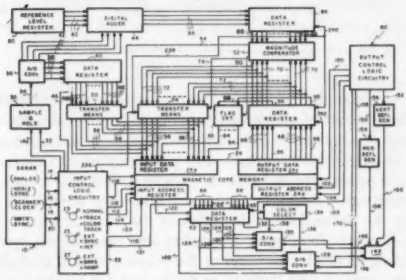
a temperature sensing detector;

a body of synthetic resin material defining an outer surface and an internal cavity substantially surrounded by the resin material and spaced within said outer surface approximately 5/16", said detector being disposed within said cavity in heat transfer association with said outer surface solely through said resin material thereby to sense the temperature produced thereat by a temperature condition existing outwardly of said body outer surface and having a preselected thermal transmission to said cavity controlled solely by the parameters of said resin material body including the surface heat transfer coefficient of the body, the thermal conductivity of the body material, and the heat capacity of the body to provide a preselected time delay in sensing said temperature condition, said synthetic resin material having a substantially constant thermal diffusivity over the desired operating range of the sensor assembly.

4,179,681
TARGET TRACKING SONAR SIGNAL PROCESSING AND DISPLAY SYSTEM

William J. Zehner, Lynn Haven, and Henry L. Warner, Panama City, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 5, 1973, Ser. No. 339,664
Int. Cl.[2] G01S 9/66, 7/62
U.S. Cl. 367—110 **12 Claims**



1. A sonar signal processing and display system for use with a source of analog sonar return signals, transmitter sync signals, scanner clock signals, and line sync signals, said system comprising:

memory means for storing and reading out data in multi-bit digital word form;

sample and hold means for periodically sampling said analog return signals;

analog to digital converter means, connected to said sample and hold means, for converting samples of said analog return signals into digital word signals;

first data register means, connected to said analog to digital converter means, for accumulating a predetermined number of digital words;

transfer means, connected between said first data register means and said memory means, for effecting transfer of said digital words for storage in said memory means;

input control logic circuit means for controlling said sample and hold means, said first data register means, said transfer means, and said memory means in response to said transmitter sync signals, said scanner clock signals, and said line sync signals to effect said converting and said storage at a predetermined sonar frame rate and at addresses in said memory means corresponding to locations in the sonar field of observation;

second data register means, connected to said memory means, for temporarily storing said words in a one at a time sequence as they are read out of said memory means;

digital to analog conversion means, connected to said second data register means, for converting said digital words temporarily stored therein into analog output signals;

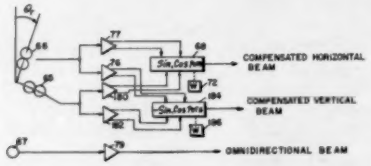
cathode ray tube display means connected to said digital to analog conversion means, for generating a display of said analog output signals; and

output control logic circuit means for controlling said memory means, said second data register means, said digital to analog conversion means, and said display means so as to display said analog output signals at a display frame rate which is a multiple of said predetermined sonar frame rate.

4,179,682
TILT COMPENSATION FOR ACOUSTIC TRANSDUCING SYSTEM

Robert L. Townsend, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 3, 1978, Ser. No. 930,824
Int. Cl.[2] G01S 3/80
U.S. Cl. 367—135 8 Claims

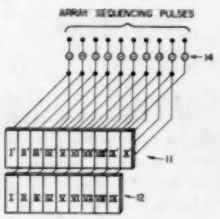


1. An acoustic transducer system comprising first and second bi-directional electro-acoustic transducers each having a maximum response axis, means for mounting said transducers with said maximum response axes perpendicular to each other and to a predetermined axis about which they may rotate, and a compensator including a vertical reference device for measuring the deflection angle between the vertical and a reference direction fixed with respect to said transducers and also including means for modifying the outputs of said transducers by functions of said deflection angle and for combining such modified outputs so as to obtain an output signal corresponding to a predetermined response pattern which does not vary substantially with rotation of said transducers about said axis.

4,179,683
METHOD AND APPARATUS FOR ENERGIZING AN ARRAY OF ACOUSTIC TRANSDUCERS TO ELIMINATE GRATING LOBES

B. Percy Hildebrand, and Gerald J. Posakony, both of Richland, Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jan. 23, 1978, Ser. No. 871,157
Int. Cl.[2] H04B 1/02, 11/00
U.S. Cl. 367—138 10 Claims



1. A method for energizing an array of acoustic transducer elements to eliminate grating lobes, comprising the steps of:

(a) propagating a first acoustic beam by energizing a first subarray of transducer elements, said first acoustic beam having odd grating lobes with a positive amplitude;

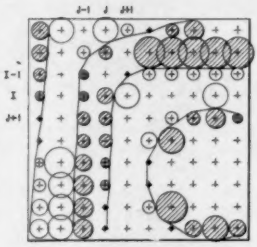
(b) propagating a second acoustic beam by energizing a second subarray of transducer elements, said second acoustic beam being physically independent from the first beam and having odd grating lobes with a negative amplitude, said first and second subarrays being substantially adjacent and said first and second acoustic beams substantially co-existing in space; and

(c) combining the first and second co-existing acoustic beams together so that the odd grating lobes from one subarray cancel the odd grating lobes from the other subarray.

4,179,684
GRAPHIC CONVERSION SYSTEM FOR ELECTRONIC DATA PROCESSING

George C. Cheng, 2220 SW. 34th St. #106, Gainesville, Fla. 32608

Filed Jul. 19, 1974, Ser. No. 490,012
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 AE 11 Claims



1. A method of graphic conversion for electronic data processing, comprising the steps of:

interpreting an image as a first analog electrical signal;

converting said first analog electrical signal into digital signals representing discrete, identifiable segments of said image and containing quantitative data representing a color value for said segments;

generating a boundary tangent circle for each of said segments as a function of said segment quantitative color data;

generating two pairs of common tangents to said boundary tangent circle for each of said segments as a function of adjacent segments quantitative color data;

selecting one tangent from each of said two pairs of common tangents as dominant tangents as a function of adjacent segments quantitative color data;

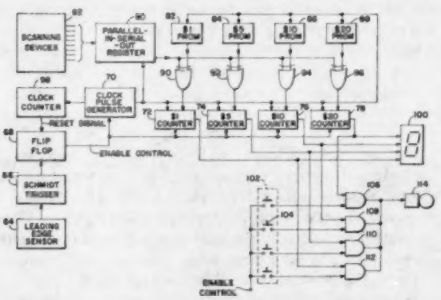
generating a second analog electrical signal as a continuous function of said dominant tangents of adjacent segments; and

converting said second analog electrical signal into a visual display.

4,179,685
AUTOMATIC CURRENCY IDENTIFICATION SYSTEM

James B. O'Maley, Lighthouse Point, Fla., assignor to Abbott Coin Counter Company, Inc., Stamford, Conn.

Filed Nov. 8, 1976, Ser. No. 739,424
Int. Cl.[2] G06K 9/00; B07C 5/342
U.S. Cl. 340—146.3 H 35 Claims



1. An automatic currency identifying system, comprising:

transport means for moving the currency past a detecting position;

scanning means at said detecting position for scanning at

least a portion of the moving currency and providing scanned information about the currency;

storage means for retaining the scanned information;

memory means for storing a predetermined information concerning the currency; and

comparison means for comparing the scanned information from the storage means with the stored information from the memory means and providing an output signal upon concurrence of a predetermined amount of information therebetween and further comprising processing means for analyzing the scanned information and controlling the other means, and wherein said scanning means comprises scanning elements and at least two leading edge sensors positioned at spaced apart locations transversely to moving the currency, each of said leading edge sensors producing an output when respectively detecting the leading edge of the currency, and wherein said processing means includes means for measuring the time difference between the occurrence of said leading edge sensor outputs, and timing means associated with said transport means and coupled to said processing means for providing an indication of the speed of the transport, said processing means utilizing said time difference and said speed indication to determine the skew angle of the currency.

4,179,686

SYSTEM FOR CHECKING THE AUTHENTICITY OF IDENTIFICATION PAPERS

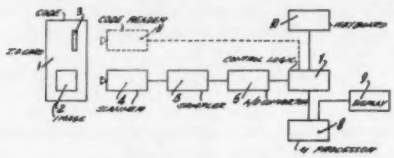
Maria P. Bonicalzi, via Rovere 15, and Mario M. De Gasperi, Vic. Ciovasso 11, both of Milan, Italy

Filed Nov. 2, 1977, Ser. No. 847,906

Claims priority, application Italy, Nov. 3, 1976, 29011 A/76[U]

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 AG **4 Claims**



1. A system for checking the authenticity of identification papers, wherein the use is made of an identification paper provided with the image or photo of the person to be identified, comprising the steps of determining and storing an image code formed of characteristic parameters based on luminance levels of said image and checking the authenticity of the paper at the time of use in a suitable control apparatus by scanning the image thereon, providing for redetermining the characteristic parameters of the image, and comparing said redetermined parameters with the coded ones, upon which a signal of effected check is emitted.

4,179,687

ANALOG-TO-DIGITAL CONVERTER CIRCUIT EMPLOYING ITERATIVE SUBTRACTION

Rudy J. van de Plassche, and Eise C. Dijkmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,105

Claims priority, application Netherlands, Aug. 30, 1976, 7609608

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD **31 Claims**

1. Analog-to-digital conversion circuit having a plurality of series-connected stages, each stage comprising:

a common terminal;

an output terminal;

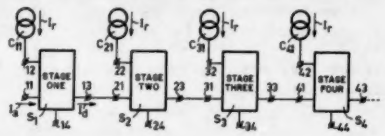
a first reference current source being connected to said common terminal;

diode means connecting said common terminal to said output terminal forming a first current path and having a forward direction; the forward direction, viewed from said common terminal being the same for all stages in said series-connection and being the same as the current direction of said reference current source;

a current sink;

a logic output;

a first transistor, the base being connected to said common terminal, the emitter being connected to said current sink and a collector being connected to said logic output, forming a second current path, said first transistor having a conductivity type such that the forward direction of its base-emitter junction, viewed from said common terminal,



is opposite to the forward direction of said diode means; and

means for biasing said two current paths such that at one time only one of said two current paths is forward biased;

said common terminal of the first stage of said series-connection forming an input for an analog input current and the common terminal of each other stage being connected to the output terminal of the stage preceding it.

means for detecting the polarity of said difference serving to indicate the level of current output of said stage;

a detection output terminal connected to said polarity detection means to provide digital indication of the level of current at each stage;

means to count the number of successive stages having a positive current on said current output terminal; said count being a digital measure of the magnitude of said input current.

4,179,688

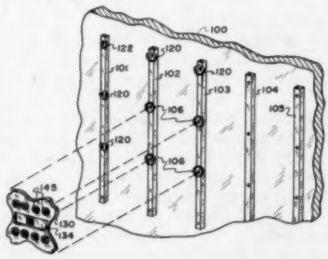
INFORMATION DISPLAY SYSTEM

Russell H. Romney, 3259 Bon View Dr., Salt Lake City, Utah 84109

Filed Jan. 31, 1977, Ser. No. 763,914

Int. Cl.[2] G08B *5/00*

U.S. Cl. 340—373 **18 Claims**



1. Apparatus for presenting and controlling a large number of individual radiatively functional elements over a large display area and for ultimately connecting each and all of said elements with a main central area control station comprising, in combination:

(a) a supporting base behind and generally coextensive with

the display area, said main station being associated with said base,

(b) a plurality of separate individual module support members supported by said base in rows and columns for holding the elements in the display area in module groups and in contiguous rows and columns, each of said separate module support members including separate sub-area means for holding a plurality of small sub-groups of said elements in respective module sub-areas,

(c) front panel means located between the modular support members and the functional elements and including sub-groups of electrical connectors for establishing electrical contact between each individual element in the sub-group and a central sub-group control point, said sub-group control points being symmetrically arranged behind the elements which constitute the module area,

(d) further panel means arranged between the front panel means and the respective module support members and including electrical connectors between each of the sub-group control points and a central module control point, and

(e) means connecting each of said central module points to the main control station.

4,179,689

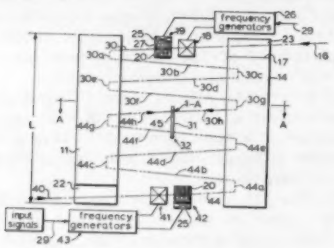
GRAPHIC SYMBOL DISPLAY SYSTEM

Joseph T. McNaney, 8548 Boulder Dr., La Mesa, Calif. 92041

Filed Oct. 26, 1978, Ser. No. 955,111

Int. Cl.[2] G01J *1/34;* G08B *5/36*

U.S. Cl. 340—378.3 **5 Claims**



1. In a graphic symbol display system:

(a) a primary source of light;

(b) light mask means for providing an array of graphic symbol light beam forming means and means for exposing beam forming means of said array, selectively, to light from said primary source for providing any one of a plurality of individual graphic symbol shaped sources of light;

(c) a graphic symbol display medium;

(d) said array of beam forming means and said display medium positioned, respectively, at first and second ends of graphic symbol shaped light beam optical paths of said system;

(e) optical means positioned along an optical axis of said system intermediate said array of beam forming means and said display medium for projecting an image of a beam forming means selectively exposed to light from said primary source toward a predetermined symbol display position at said display medium, said display position representative of a reference position at said display medium;

(f) acousto-optic light reflector means including an interaction medium and acoustic wave generator means for establishing any of a number of different acoustic wave light reflecting conditions within said medium thereof, said interaction medium positioned intermediate said array of beam forming means and said optical means positioned along said optical axis;

(g) means for exposing a predetermined one of said beam forming means of said array to light from said primary source and establishing, simultaneously, a predetermined one of said light reflecting conditions within said interaction medium for allowing said display medium to be exposed to a light image of said predetermined one of said beam forming means through said optical means and coincident with said reference position at said display medium;

(h) means for exposing another predetermined one of said beam forming means to light from said primary source and establishing, simultaneously, another predetermined one of said light reflecting conditions within said interaction medium for allowing said display medium to be exposed to a light image of said other predetermined one of said beam forming means through said optical means and coincident with said reference position at said display medium.

4,179,690

TWO-TONE AUDIBLE WARNING CIRCUITS

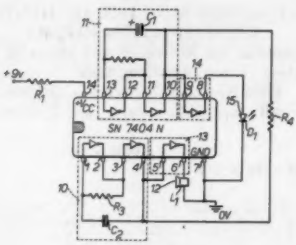
Mark S. Nicholls, Northampton, England, assignor to The Mettoy Company Limited, Northampton, England

Filed Oct. 3, 1977, Ser. No. 838,832

Claims priority, application United Kingdom, Oct. 7, 1976, 41831/76

Int. Cl.[2] G08B *3/10*

U.S. Cl. 340—384 E **10 Claims**



1. A circuit for producing an audible signal, comprising:

a sounder connected to an audio frequency signal generator circuit for producing the audible signal;

a modulator circuit connected to the signal generator circuit for controlling the signal generator circuit to alter the frequency of operation thereof; said signal generating circuit and said modulator circuit each comprises two inverters connected in series with a resistor connected in parallel with one of the two inverters; and

a capacitor connected in parallel with the series combination of the two inverters, all said inverters being provided on a single integrated circuit package.

4,179,691

INFRARED INTRUSION DETECTOR CIRCUIT

Hansjürg Keller, Männedorf, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

Filed Jul. 22, 1977, Ser. No. 817,916

Claims priority, application Switzerland, Nov. 15, 1976, 14272/76

Int. Cl.[2] G01D *27/04;* G08B *13/18*

U.S. Cl. 340—567 **19 Claims**

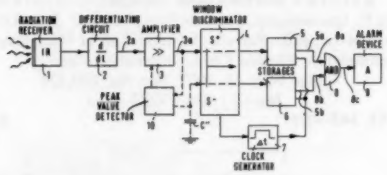
1. In a circuit arrangement for an infrared intrusion detector of the type possessing a number of mutually spaced receiving regions and a spacing between each two adjacent receiving regions and a radiation receiver providing output electrical signals in accordance with the infrared radiation which is absorbed from all of the receiving regions, the improvement which comprises:

said output electrical signals having an ascent and descent representative of a change in infrared radiation due to an

intruder traversing one single receiving region or one single spacing between adjacent receiving regions;

said circuit including:

means responsive to said output electrical signals for providing output electrical signals indicative of the ascent and descent of said change in infrared radiation; and



means for processing said output electrical signals of said responsive means for triggering an alarm signal when the received infrared radiation, within a predetermined delay time, only once ascends in a predetermined manner and only once descends in a predetermined manner.

4,179,692

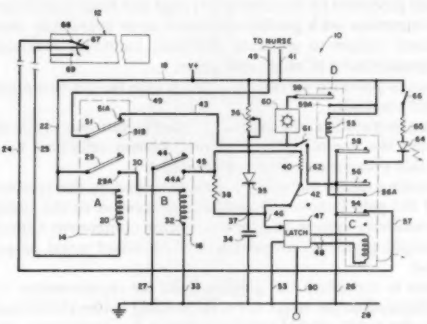
APPARATUS TO INDICATE WHEN A PATIENT HAS EVACUATED A BED OR DEMONSTRATES A RESTLESS CONDITION

Dwight A. Vance, 8709 E. 29, Tulsa, Okla. 74129

Filed May 5, 1977, Ser. No. 794,041

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—573 **9 Claims**



1. A monitoring system for bed patients comprising;

(a) a binary signal generating means adapted to produce a first signal when a body is in a rest position in a bed; and a second signal when said body is out of said bed;

said signal generating means adapted to produce transient changes from one to another of said first and second signals, when said body is in said bed but is not at rest; the frequency of said changes from one to the other of said first and second signals, increasing with the restlessness of said body in said bed;

(b) signal processing means comprising;

(1) means responsive to said second signal to increase the magnitude of a selected physical quantity at at least one selected rate;

(2) means responsive to said first signal to decrease said magnitude of said physical quantity at a selected one of a plurality of rates;

(3) latch means and means to set said latch means responsive to a predetermined magnitude of said physical quantity, and means responsive to the setting of said latch means to set an alarm when said magnitude reaches a selected value.

4,179,693

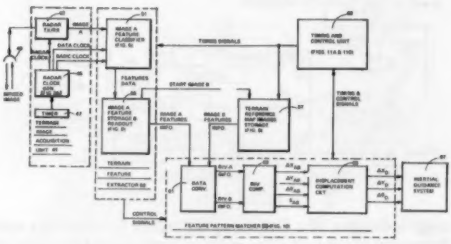
AUTONOMOUS, CHECK-POINTING, NAVIGATIONAL SYSTEM FOR AN AIRBORNE VEHICLE

Gregory W. Evans, Whittier, and James E. Paul, Anaheim, both of Calif., assignors to Rockwell Internation Corporation, El Segundo, Calif.

Filed May 23, 1977, Ser. No. 799,423

Int. Cl.[2] G01S *9/02*

U.S. Cl. 343—5 MM **6 Claims**



1. A navigational system comprising:

means for periodically generating a first pattern of terrain features from a sensed image of ground terrain, said generating means including:

means for periodically sensing an image of ground terrain; and

means for extracting the first pattern of terrain features contained in the sensed image;

means for prestoring a second pattern of terrain features contained in a reference image, said sensed image substantially corresponding to a portion of the reference image;

means selectively responsive to the first and second patterns of terrain features for determining the relative coordinate and orientation displacements of the first pattern within the second pattern, said determining means including:

means responsive to the features of the first and second patterns for selectively developing a feature neighborhood of nearby features surrounding each feature in the first and second patterns;

means selectively responsive to the feature neighborhoods of the first and second patterns for developing a plurality of neighborhood comparison signals indicative of the closeness of match and coordinate and orientation displacements between each feature neighborhood of the first pattern with respect to each feature neighborhood of the second pattern; and

means responsive to the neighborhood comparison signals for computing the relative coordinate and orientation displacements of the first pattern within the second pattern; and

means responsive to the relative coordinate and orientation displacements for updating position and heading coordinates of the navigational system.

4,179,694

FREQUENCY CONTROL SYSTEMS

Christopher J. Alder, Emsworth, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Dec. 19, 1977, Ser. No. 862,186

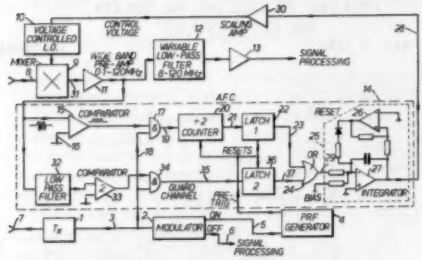
Claims priority, application United Kingdom, Dec. 21, 1976, 53259/76

Int. Cl.[2] G01S *9/02*

U.S. Cl. 343—5 AF **6 Claims**

1. An AFC system for a radar system comprising a radar pulse transmitter, a radar echo pulse receiver including a mixer responsive to received echo signals and to transmitted pulses generated by the radar pulse transmitter, a controlled local oscillator providing a local oscillator signal for the said mixer nominally at the same carrier frequency as the said pulse transmitter so that the said receiver operates without an intermedi-

ate frequency stage, a counter, gating means operative responsively to the transmission of the radar pulse by the said pulse transmitter for passing signals derived from the said mixer to said counter and control signal producing means operative responsively to said counter reaching a predetermined count



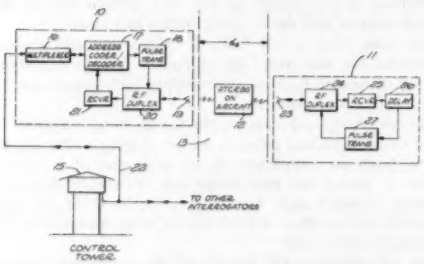
stage indicative of a frequency difference between the carrier frequency of the said radar pulse transmitter and the controlled local oscillator, for providing a control signal which is fed to the controlled oscillator so as to tend to nullify the said frequency difference.

4,179,695

SYSTEM FOR IDENTIFICATION OF AIRCRAFT ON AIRPORT SURFACE PATHWAYS

Arnold M. Levine, Chatsworth, Calif., and Ray O. Waddoups, Mesa, Ariz., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,729
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **10 Claims**



1. A vehicle identification system particularly for surveillance of aircraft on predetermined surface pathways including runways and other areas of an airport surface, said aircraft having ATCRBS equipment comprising:

at least one transmitting interrogation located on said airport surface adjacent to a selected one of said surface pathways and spaced laterally by a first distance with respect to the centerline of said pathway;

first means connected at said remote location and connected to said interrogator for providing activating signals to said interrogator to transmit a first RF pulse;

second means comprising a transponder responsive to said first RF pulse to produce a second RF pulse, said transponder being located on said surface on the side of said pathway centerline opposite said interrogator to generate a second RF pulse in fixed time relationship after said first RF pulse, said first and second pulse forming a pulse pair for activation of said ATCRBS equipment on a selected aircraft on said pathway in the vicinity of said interrogator and said second means transponder;

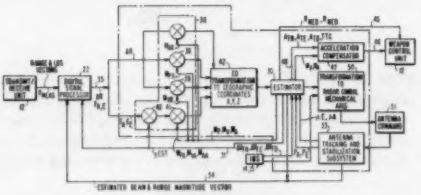
delay means within said second means transponder for delaying the generation of said second RF pulse after reception of said first RF pulse such that said fixed time relationship between said first and second RF pulses forms a properly spaced pulse pair for activation of said ATCRBS equipment, said ATCRBS thereafter broadcasting a predetermined reply code comprising at least an identification code receivable at said remote location.

4,179,696

KALMAN ESTIMATOR TRACKING SYSTEM

Elmen C. Quesinberry, Severna Park; Michael Tom, Glen Burnie, and James L. Farrell, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1977, Ser. No. 800,121
Int. Cl.[2] G01S *9/22, 9/44*
U.S. Cl. 343—7.4 **6 Claims**



1. A radar system for tracking a target comprising:

an antenna for repetitively sensing reflected radar pulses from the target,

means responsive to the reflected pulses to generate signals referenced to a line-of-sight coordinate system, including signals representative of measured range and measured angle of the target,

means governed by the measured range and angle signals for comparison with predictions based upon previously estimated values to generate residuals, including residuals representative of range and angle,

means to generate variable estimation gain factors to weight said residuals,

means to transform the product of gain factors and residuals from the line-of-sight coordinate system reference to a stable coordinate system reference,

estimating means including means governed by the product of the gain factors and residuals referenced to the stable coordinate system to generate vector component values, including values representative of estimated target range, and

means to transform the generated values representative of estimated target range to corresponding values referenced to the radar gimbal mechanical axis for positioning the antenna in accordance with the estimated target position.

4,179,697

PASSIVE RANGING METHOD

Martin Golinsky, East Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 27, 1978, Ser. No. 873,005
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—112 D **9 Claims**

9. A method of passively determining the range of an airborne target from a test aircraft comprising:

traversing a circular path in the test aircraft;

detecting the presence of a radio energy signal by the test aircraft at least four discrete times;

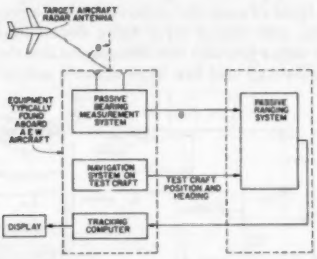
generating a detection signal responsive to the angle of arrival of each of said radio energy signals;

generating a positioning signal derived from the test vehicle's position at the time of reception of each of said radio energy signals;

storing said detection signals and said positioning signals in a storage device;

energizing an apparatus for determining the course and range of the target from said stored signals;

generating an electrical target indication signal representative of the range and course of the target as determined, and



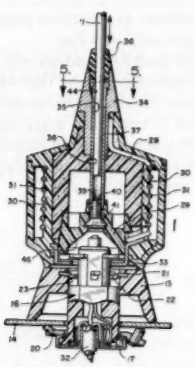
using said indication signal to activate a display representative of the target.

4,179,698

MOBILE ANTENNA WITH ADJUSTABLE RADIATING ELEMENT

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Filed Dec. 13, 1977, Ser. No. 860,245
Int. Cl.[2] H01Q *1/32, 9/00, 1/50, 9/30*
U.S. Cl. 343—715 **9 Claims**



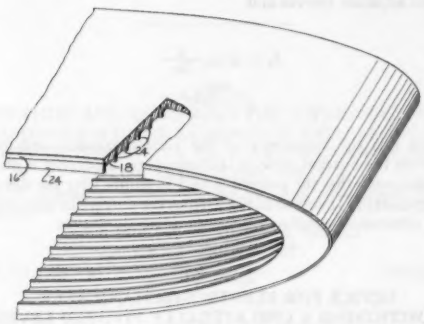
1. A mobile antenna comprising, in combination:
an antenna base housing comprising walls defining a first opening means in said housing, the walls adjacent said opening means being inwardly converging;
an elongated radiating element extending into said first opening means;
a loading coil carried within said housing;
an elongated sleeve slidably carried within said housing and said first opening means and in conductive relationship with said coil, said sleeve comprising an enlarged outer end portion positioned between said converging walls and telescopically receiving said radiating element therewithin, the other end of said sleeve being disposed within said housing, inwardly of said outer end portion,
locking means disposed within said housing and operable from the exterior thereof for cooperating with the inward end portion of said sleeve to draw said sleeve into said housing, whereby engagement between said converging walls and said enlarged end of said sleeve causes said sleeve to securely grip said radiating element, thereby locking said radiating element in position with respect to said housing.

4,179,699

LOW REFLECTIVITY RADOME

Clarence D. Lunden, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 5, 1977, Ser. No. 813,065
Int. Cl.[2] H01O *1/42*
U.S. Cl. 343—872 **10 Claims**



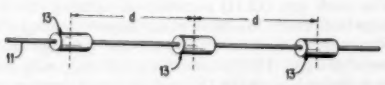
1. A low reflectivity radome for a radar antenna, said radome essentially including an enclosure consisting of foamed plastic material, said enclosure defining a smooth air-side surface and a concave inner surface, and a plurality of stiffener ribs each consisting of resin-bonded glass fibers, each of said ribs being disposed to compressively strengthen and reinforce said enclosure against buckling under compression by extending in an orthogonal manner along a plane normal to a tangent to said air-side surface and at least partially embedded within said enclosure, said ribs being spaced apart and spaced from both the air-side surface and the concave inner surface of said enclosure to reduce microwave reflections.

4,179,700

METHOD AND APPARATUS FOR CONTROLLING ELECTROMAGNETIC RERADIATION FROM AN ELECTRICALLY CONDUCTING STRUCTURE

Ogden L. Prestholdt, 8905 Maxwell Dr., Potomac, Md. 20854

Filed Nov. 17, 1977, Ser. No. 852,453
Int. Cl.[2] H01Q *1/52*
U.S. Cl. 343—885 **10 Claims**



1. Apparatus for controlling electromagnetic reradiation of electrically conducting structures wherein the reradiation is caused by current flow in said structures from an electromagnetic field radiated in space from a primary source at a spaced distance from the said structure, wherein said structure has a cross-sectional equivalent radius a interfering with electromagnetic radiation of a wavelength λ (meters), comprising an annular prism-shaped sleeve of high magnetic permeability material μ, said sleeve having a length l (cm), a cross-sectional equivalent outer radius b (cm), a cross-sectional equivalent inner radius a (cm), wherein the inductance L (microhenries) of said sleeve is,

$$L = 0.002l[\ln_e \frac{2lb(\mu-1)}{a^{\mu}} - 1],$$

means for positioning a plurality of said sleeves about said

electrically conducting structure at a spaced-apart distance d such that

$$\tan \frac{\pi d}{\lambda} \cong \frac{2Z_o}{x}$$

where Z_o is the characteristic impedance of the structure between adjacent sleeves and

$$Z_o = 60 \ln_e \frac{d}{2a},$$

and

$$x = 2\pi fL$$

where f is the frequency of the electromagnetic radiation wherein the current flow in said structure undergoes a phase reversal such that the current in said structure near the sleeves is substantially reversed in phase from the current in said structure substantially midway between adjacent sleeves.

4,179,701

DEVICE FOR ELECTROMECHANICALLY POSITIONING A UNILATERALLY PIVOTED LEVER ARM IN THREE DIFFERENT STABLE POSITIONS

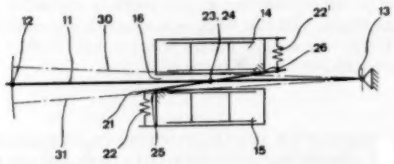
Jean-Jacques Bärtschi, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

Filed May 15, 1978, Ser. No. 905,743

Claims priority, application Switzerland, May 13, 1977, 6011/77

Int. Cl.[2] **G01D** *9/28, 15/16*

U.S. Cl. 346—62 **6 Claims**



1. Device for positioning a unilaterally pivoted lever arm in three different stable positions with two solenoids characterized by the facts that lever arm (**11**) is rigidly connected in a forked fashion to a second parallel arm (**10**), that a shaft (**13**) perpendicular to the two arms (**10,11**) provides the pivoting axis, that each arm (**10,11**) possesses an opening (**24**) at equal distances from shaft (**13**), that a plate-shaped pivoting armature (**21**) is suspended with tabs (**23**) in these openings (**24**) while positioned in a gap (**16**) between two axially opposed, individually switched solenoids (**14,15**), each having a contact area and diagonally opposing abutments (**25,26**) for pivoting armature (**21**), and that at least one spring (**22**) is provided to press pivoting armature (**21**) against the two abutments (**25,26**) in such a manner that when in the neutral position the pivoting armature (**21**) will be at rest diagonal in the gap (**16**) between the two solenoids (**14,15**).

4,179,702

CASCADE SOLAR CELLS

Michael F. Lamorte, Durham, N.C., assignor to Research Triangle Institute, N.C.

Filed Mar. 9, 1978, Ser. No. 885,077

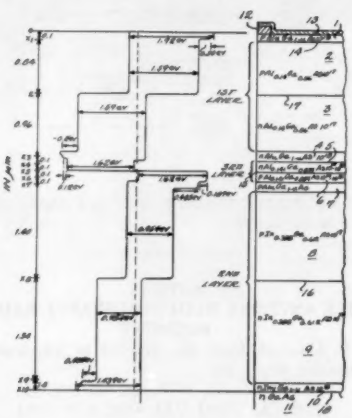
Int. Cl.[2] **H01L** *27/14*

U.S. Cl. 357—30 **25 Claims**

1. A monolithic cascade cell for converting incident radiation into electrical energy comprising:

a first semi-conductive layer of a first material having a first given bandgap, said first layer being doped into p and n regions with a junction therebetween so that incidence of radiation of wavelength above a predetermined energy produces an electrical potential across said junction of said first layer and below said first predetermined energy substantially passes through said first layer;

a second layer of a second material having a second given bandgap, said second layer being doped into p and n regions with a junction therebetween so that the radiation passing through said first layer above a second predetermined energy produces an electrical potential across said junction of said second layer; and



a third layer between said first and second layers of a third material having a bandgap greater than said first bandgap, so that substantially no electrical energy is produced by radiation absorbed in said third layer, and doped into p and n regions with a homojunction forming a tunnel junction therebetween to electrically connect said potentials in said first and second layers in series.

4,179,703

SYSTEM FOR TRANSMITTING TWO COLOR TV SIGNALS

Liston Abbott, E. Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,628

Int. Cl.[2] **H04N** *9/00*

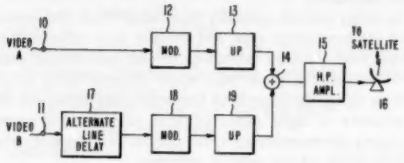
U.S. Cl. 358—11 **6 Claims**

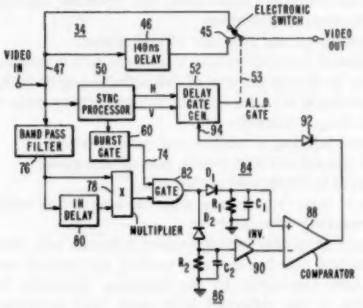
1. In a system in which alternate lines of one color television video signal normally are delayed half the period of the color subcarrier at a transmitting terminal to minimize the cross modulation of the color subcarrier with the color subcarrier of another video signal amplified in a common amplifier such as in a satellite transponder, the combination of

an intermediate line delay unit at the receiving terminal normally operative to delay intermediate lines of said one video signal half the period of the color subcarrier, and having an inhibit input, and

inhibit signal generating means coupled to said inhibit input

automatically to inhibit said intermediate line delay unit from delaying intermediate lines of said one video signal





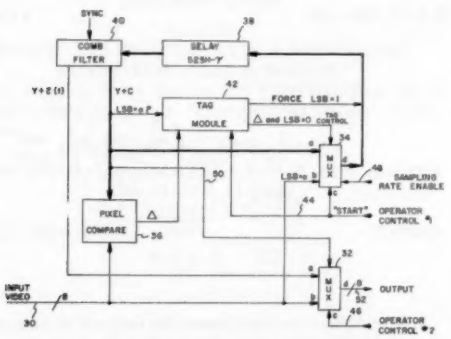
when the received alternate lines of said one video signal are not delayed at the transmitting terminal.

4,179,704

TELEVISION SYSTEM FOR DISPLAYING AND RECORDING PATHS OF MOTION

J. Kenneth Moore, Stamford; Arthur Kaiser, Trumbull, and Henry W. Mahler, Newtown, all of Conn., assignors to CBS Inc., New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,405
Int. Cl.[2] H04N *5/22, 9/32, 7/18, 5/24*
U.S. Cl. 358—22 **26 Claims**



22. Method for generating a video signal for displaying simultaneously a succession of images of an object moving over a selected time period in an otherwise substantially static scene, comprising the steps of:

(a) storing a reference field of video representing said scene at the start of said selected time period;

(b) comparing picture elements of selected time-separated television fields subsequently arriving during said selected time period with corresponding picture elements of said reference field;

(c) substituting in said stored reference field those picture elements of said subsequently arriving fields shown by step (b) to be different from those in said reference field and tagging said substituted picture elements to preclude another substitution of the same picture elements in the reference field; and

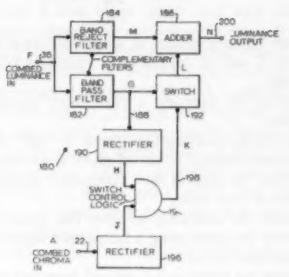
(d) at the termination of said selected time period, providing a video signal representing said scene with the substitution therein of those picture elements tagged during the selected time period.

4,179,705

METHOD AND APPARATUS FOR SEPARATION OF CHROMINANCE AND LUMINANCE WITH ADAPTIVE COMB FILTERING IN A QUADRATURE MODULATED COLOR TELEVISION SYSTEM

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Mar. 13, 1978, Ser. No. 886,164
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—31 **10 Claims**



1. An adaptive comb filter for separating chrominance and luminance information of a quadrature modulated color television signal and the like having interleaved chroma and luminance sidebands, comprising:

a filter input receiving said quadrature modulated color television signal,

chroma separation circuit means including

delay line and bandpass filter means connected to said filter input for providing bandpass filtering of said signal and for providing an output delayed by the period of one horizontal scan line,

high pass filter means connected to said filter input for passing high frequency components of said signal, and

first subtractor means connected to said delay line and bandpass filter means and to said high pass filter means for providing as an output the difference thereof, being said separated chroma;

adaptive luminance separation circuit means including

threshold circuit means connected to the output of said first subtractor means to receive said separated chroma, for putting out only those portions of said separated chroma which exceed a predetermined threshold,

limiting amplifier means connected to said threshold circuit means for putting out squared waves in phase with said portions only when they exceed said predetermined threshold,

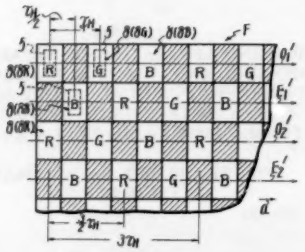
adder circuit means having inputs connected to combine the outputs of said threshold circuit means and said limiting amplifier means,

second subtractor means connected to said filter input and to said adder circuit means for subtracting the output of said adder circuit means from said received color television signal the difference therefrom being said adaptively separated and filtered luminance.

4,179,706
COLOR CAMERA SYSTEM

Toshimichi Nishimura, Tama; Seisuke Yamanaka, Mitaka, and Masaru Shimada, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,596
Claims priority, application Japan, Jan. 14, 1977, 52-3316
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—44 12 Claims

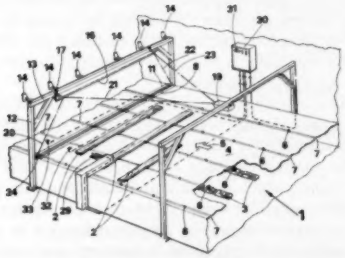


1. Color camera system in which colors are modulated at a frequency f_s and is obtained in opposite phase line by line comprising:
(a) means for deriving a composite signal from a pickup device,
(b) means for shifting the phase by 180° of one horizontal line with respect to an adjacent horizontal line,
(c) means for mixing said composite signals obtained from adjacent two lines,
(d) means for checking whether the signal is chromatic,
(e) means for generating a luminance signal from said mixed composite signal,
(f) means for detecting a second harmonic component of f_s from said mixed composite signal, and
(g) means for controlling the frequency response of said luminance signal in response to said second harmonic.

4,179,707
AUTOMATIC MEASUREMENT OF LENGTHS OF ELONGATED WORKPIECES

Bo Sjödin, Jönköping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Oct. 12, 1977, Ser. No. 841,378
Claims priority, application Sweden, Oct. 13, 1976, 7611329
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—107 7 Claims

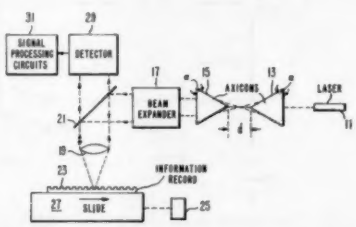


1. Apparatus for automatically producing an output corresponding to the length of each of a plurality of elongated workpieces, said apparatus being characterized by:
A. transporting means for supporting workpieces with their lengths extending substantially in a scanning direction and for moving the workpieces transversely to said scanning direction, said transporting means defining a plane in which the workpieces move and in which there is an elongated measuring zone that extends lengthwise in the scanning direction and is at least as long as the longest workpiece to be measured;
B. an array camera optically equidistant from the opposite ends of the measuring zone and located in a reflected light path that has a portion extending to one side of said plane from the measuring zone, said array camera being arranged to scan along the length of the measuring zone and being responsive to light reflected from said zone to produce an output corresponding to the length of a segment along said zone from which light is reflected;
C. illumination means for enabling a workpiece at the measuring zone to reflect light along said reflected light path, said illumination means being
(1) spaced to said one side of said plane,
(2) spaced in one direction transverse to the scanning direction from said portion of the reflected light path, and
(3) arranged for illuminating the measuring zone all along the length thereof;
D. means defining a background surface which
(1) is spaced to the opposite side of said plane,
(2) faces towards said plane, and
(3) is at least coextensive with the length and width of the measuring zone; and
E. opaque screening means located between said illumination means and said background surface and spaced in said one direction transverse to the scanning direction from said portion of the reflected light path, said screening means being arranged to shadow the background surface from light from the illumination means so that the shadowed background surface provides a strong contrast to the light reflecting surface of a workpiece as the measuring zone, to afford accuracy in scanning the workpiece.

4,179,708
OPTICAL PLAYBACK SYSTEM HAVING INCREASED DEPTH-OF-FIELD

Ping Sheng, Princeton, and Arthur H. Firester, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1978, Ser. No. 881,366
Int. Cl.[2] G11B 7/00
U.S. Cl. 358—128 8 Claims



1. In an optical playback system for retrieval of information recorded in the form of an elongated track on a surface of a record medium, said elongated track comprising a succession of depressed areas, of a given width, of a given depth and of variable lengths, alternating along the length of said track with relatively non-depressed areas; and apparatus comprising:
means for providing a beam of coherent light;
means for rendering a central portion of said beam substantially free of the light forming said beam, said rendering means providing a beam output having uniform light phase along transverse cross-sections thereof;
means for focusing said beam output of said rendering means to a light spot near said surface of said recording medium;
means for establishing relative motion between said elongated track and said focused light spot; and
light detection means, responsive to light which interacted

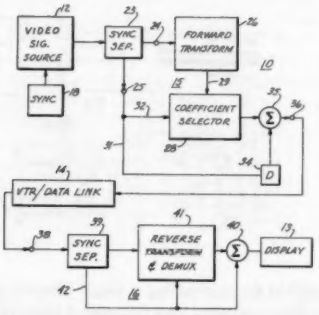
with said elongated track during the occurrence of said relative motion, for developing electrical signals representative of said recorded information.

4,179,709

VIDEO INFORMATION BANDWIDTH COMPRESSION

Dennis L. Workman, Morgan Hill, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 10, 1978, Ser. No. 868,236
Int. Cl.[2] H04M 7/12
U.S. Cl. 358—133 **130 Claims**



1. A method of video information bandwidth compression, comprising in combination the steps of:

arranging said video information in image fields and subfields;

providing for said subfields a system of coefficients having a first coefficient indicative of average subfield luminance as to any given subfield and including a selected number of further coefficients indicative of spatial content of the particular subfield; and

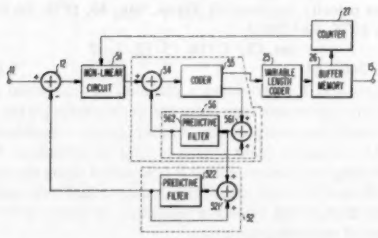
updating said first and further coefficients, with said first coefficient being updated for each subfield as to each utilized field and said further coefficients being updated less frequently than said first coefficient.

4,179,710

PREDICTIVE ENCODER WITH A NON-LINEAR QUANTIZING CHARACTERISTIC

Tatsuo Ishiguro; Norio Suzuki, and Yukihiko Iijima, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 771,048
Claims priority, application Japan, Feb. 23, 1976, 51-19294, Jun. 11, 1976, 51-68521
Int. Cl.[2] H04N 5/40, 9/40
U.S. Cl. 358—135 **6 Claims**



1. A predictive encoder for encoding an input signal of high correlation by the use of correlation techniques, said encoder comprising:

means for producing a predictive signal corresponding to the amplitude value to said input signal at a preceding sample;

means supplied with said input signal and said predictive signal in a timed relation for producing a predictive error signal representing the difference therebetween; and

quantizer means for quantizing said predictive error signal to produce information codes, said quantizer means including a plurality of circuits having different non-linear characteristics wherein said circuits are read-only memories which produce information codes according to respective ones of said different non-linear characteristics, the transmission gain of said quantizer means being less than unity when the amplitude component of said predictive error signal is smaller than a predetermined level and being substantially equal to unity when said amplitude component of said predictive error signal is higher than said predetermined level.

6. A predictive encoder for encoding an input signal of high correlation by the use of correlation techniques, said encoder comprising:

means for producing a predictive signal corresponding to the amplitude value to said input signal at a preceding sample;

means supplied wi h said input signal and said predictive signal in a timed relation for producing a predictive error signal representing the difference therebetween;

quantizer means including a plurality of circuits having different non-linear characteristics for quantizing said predictive error signal to produce information codes, the transmission gain of said quantizer means being less than unity when the amplitude component of said predictive error signal is smaller than a predetermined level and being substantially equal to unity when said amplitude component of said predictive error signal is higher than said predetermined level;

means for converting said information codes into variable length codes;

buffer memory means for temporarily storing said variable length codes for readout at a predetermined rate and including means for producing a buffer status signal indicative of buffer occupancy of said buffer memory means;

said quantizer means further including an intraframe predictive coder providing outputs to said means for producing a predictive signal and to said means for converting said information codes into variable length codes, said means for producing a predictive error signal being an intraframe local demodulator, and control means responsive to said buffer status signal for selecting one of said plurality of non-linear characteristics.

4,179,711

DEFECT NOISE COMPENSATING SYSTEM

Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 3, 1978, Ser. No. 866,216
Claims priority, application Japan, Jan. 14, 1977, 52/3314
Int. Cl.[2] H04N 3/14
U.S. Cl. 358—213 **5 Claims**

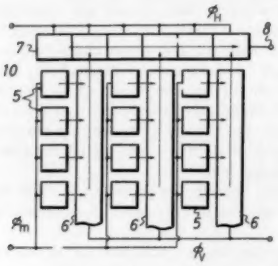
1. A defect noise compensating system for a solid state television camera which employs a solid state area imaging device having a predetermined number of picture elements aligned in both horizontal and vertical directions, optical means for projecting an image of an object on said solid state area imaging device, generator means for supplying a drive signal to said area imaging device, and means for deriving a video signal corresponding to said image out of said area imaging device, said defect noise compensating system comprising:

(a) memory means having a plurality of memory cells each corresponding to each of said picture elements of the area imaging device, wherein predetermined memory cells corresponding to deteriorated picture elements delivers identification signals for defect noise occurrence,

(b) means for reading out the whole contents of said memory

device in accordance with the reading out order of said picture elements, and

(c) means for suppressing defect noises contained in the output of said area imaging device in response to the identification signals appearing at the output of said memory device,



said memory means including a memory device having a plurality of photo sensitive elements as memory cells, and a photo mask to be positioned in front of said memory device, said photo mask being coded in accordance with the defect positions of said picture elements.

4,179,712

SYSTEM FOR ELECTRONIC EDITING OF TAPE

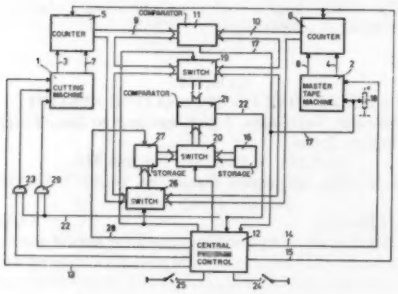
Christian Opelt, Bernbach, Fed. Rep. of Germany, assignor to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,160

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727760

Int. Cl.[2] H04N *5/78*; G11B *27/08*

U.S. Cl. 360—14 **7 Claims**



1. A system for electronic tape editing with magnetic tape recording and play-back machines for video signals, whereby program portions are recorded from a feeding machine to a cutting machine in arbitrarily chosen sequence and length, the machines are movable in forward and reverse motion by means of tape feeding shafts and servo controls containing tacho generator pulses for driving the feeding shafts, the count of said tacho generator pulses from an arbitrary editing start serving as information of the actual tape position in both machines and in both running directions.

4,179,713

METHOD AND EQUIPMENT FOR THE PRODUCTION OF MULTI-CHANNEL SOUND SIGNAL

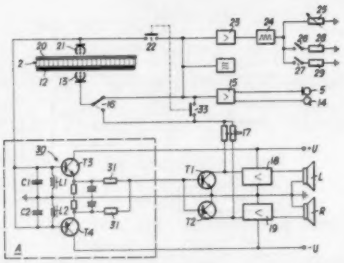
Otto Freudenschuss, and Gerd Kittag, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation of Ser. No. 677,123, Apr. 15, 1976. This application Oct. 26, 1977, Ser. No. 845,674

Claims priority, application Austria, Apr. 18, 1975, 3012/75

Int. Cl.[2] G11B *5/43, 5/02*

U.S. Cl. 360—27 **4 Claims**



1. A method for converting a single channel sound signal which has been recorded on a first sound track of a recording medium into at least a two channel stereo sound signal, comprising the steps of:

reproducing said single channel sound signal from said first sound track,

deriving a second sound signal by changing the phase of said reproduced single channel sound signal,

recording said second sound signal on a second sound track of the recording medium,

reproducing simultaneously said single channel sound signal from said first sound track and said second sound signal from said second sound track,

feeding said reproduced single channel sound signal and said reproduced second sound signal to an addition stage and a substraction stage, each of said stages producing an output signal, and

introducing one of said output signals into a first playback channel corresponding to one of said two stereo channels and introducing the other of said output signals into a second playback channel corresponding to the other of said two stereo channels.

4,179,714

METHOD OF RECORDING AN INDEX SIGNAL IN DICTATING TAPE RECORDER

Minoru Kobayashi, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Sep. 23, 1976, Ser. No. 725,964

Claims priority, application Japan, Sep. 30, 1975, 50-118472; Sep. 30, 1975, 50-118473

Int. Cl.[2] G11B *15/12, 5/02*

U.S. Cl. 360—61 **5 Claims**

1. Apparatus for providing a plurality of functional operations within a portable tape recorder device through the use of only a single operating button, said apparatus comprising:

slidably mounted plate means having an extension thereof carrying said button which is positioned along the exterior surface of the tape recorder housing to facilitate manipulation thereof for selective operation in either a first or a second opposing direction;

a capstan;

first swingably mounted pinch roller means;

second swingably mounted magnetic head means;

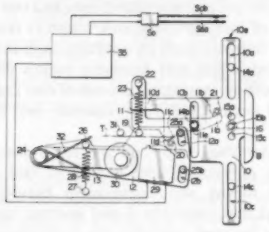
pivotally mounted intermediate lever means;

bias means interconnecting said intermediate lever means

and one of said first and second swingably mounted means;

said slidable plate having a first projection adapted to pivot said intermediate lever means in a first direction when said slidable plate is urged in said first direction, and second projection means on said slidable plate adapted to pivot said intermediate lever means in the reverse direction when said slidable plate is moved in said second opposite direction;

second resilient means interconnecting said first and second swingably mounted means whereby pivotal movement of said intermediate lever means in a first direction causes



movement of the first and second swingable assemblies in a first direction to move the tape head toward engagement with the tape for a record operation and to move the pinch roller toward abutting relationship with said capstan;

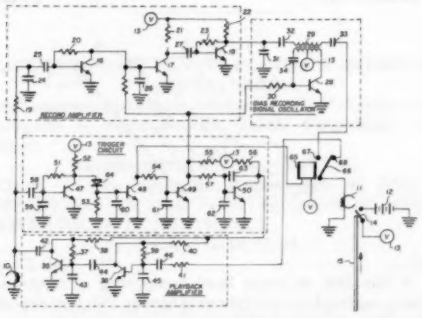
normally deenergized switch-actuated oscillator means engaged by said sliding plate when moved further in said direction to operate the switch of the switch-actuated oscillator means and thereby create a constant frequency signal adapted to be coupled to the aforesaid magnetic head while said capstan and pinch roller are in abutting relationship and said magnetic head and tape are in the record position.

4,179,715

ELECTRIC CIRCUIT FOR ACCESSORY FOR HOST TAPE RECORDER

Francis X. MacDonough, Penfield, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,530
Int. Cl.[2] G11B *5/12*
U.S. Cl. 360—61 **12 Claims**



1. Electric circuitry for an accessory for a host recorder and player, said accessory having a magnetic head for tape recording and playback and an electromagnetic transducer for sending and receiving electric signals to and from said host recorder and player, said circuitry comprising:

a. a recording amplifier arranged for amplifying an information signal and applying said amplified signal to said magnetic head for tape recording in said accessory;

b. means for generating a recording bias signal and applying said recording bias signal to said magnetic head along with said amplified signal for tape recording in said accessory;

c. a playback amplifier for receiving a playback signal from said magnetic head and amplifying said playback signal and applying said amplified playback signal to said transducer for transmission to said host recorder/player;

d. switch means for switching said circuitry into a record mode and a playback mode, said switch means activating said recording amplifier and said generating means and deactivating said playback amplifier in said record mode and deactivating said recording amplifier and said generating means and activating said playback amplifier in said playback mode; and

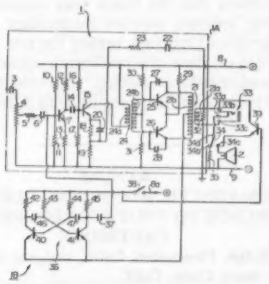
e. means for making said switching means responsive to a bias portion of a recording signal received from said host recorder/player via said transducer for switching said circuitry into said record mode when said bias portion of said recording signal from said host is received by said transducer and for switching said circuitry into said playback mode when said transducer is not receiving said bias portion of said recording signal.

4,179,716

TAPE END WARNING APPARATUS

Ken Satoh, and Tuneo Yanagida, both of Hachioji, Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Division of Ser. No. 713,344, Aug. 11, 1976. This application Nov. 13, 1978, Ser. No. 959,573
Claims priority, application Japan, Aug. 19, 1975, 50-113951; Aug. 22, 1975, 50-115878; Aug. 22, 1975, 50-115879; Oct. 3, 1975, 50-135385; Oct. 3, 1975, 50-135386; Dec. 12, 1975, 50-168208; Dec. 17, 1975, 50-170896; Dec. 23, 1975, 50-173289; Dec. 23, 1975, 50-173290; Dec. 23, 1975, 50-173291; Dec. 27, 1975, 50-177357; Dec. 27, 1975, 50-177358
Int. Cl.[2] G11B *15/06, 23/30*
U.S. Cl. 360—74.3 **2 Claims**



1. A tape end warning apparatus for use in a tape recorder of the type which includes an audio amplifier, a loudspeaker connected to the output of said audio amplifier, a tape cassette receiving chamber, a drive shaft extending into said receiving chamber and adapted to engage a drive shaft recess in said tape cassette when a tape cassette is placed within said receiving chamber, and a drive means for driving said drive shaft, said tape end warning apparatus comprising:

a power supply;

an oscillator for generating an electrical alarm signal when said power supply is applied thereto, the output of said oscillator being coupled to an input of said amplifier whereby said amplifier amplifies said electrical alarm signal;

a normally open switch adapted to apply said power source to said oscillator when said normally open switch is closed;

end of tape detecting means for closing said normally open switch when an end of tape condition is detected;

a diode connected between said normally open switch and said oscillator for preventing an undesirable audio alarm by said loudspeaker during a recording operation;

a delay circuit connected to said normally open switch and said oscillator for activating said oscillator a given time interval after said normally open switch is closed; and

an input path for a signal to be recorded, said input path being connected to said amplifier, and an electronic switch means connected to said input path and said normally open switch for preventing the signal to be recorded from being applied to said amplifier when said normally open switch is closed.

4,179,717

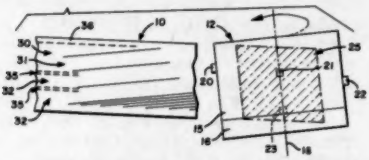
METHOD AND APPARATUS FOR VIDEO SIGNAL RECORDING

Alexander R. Maxey, Redwood City, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 874,118, Feb. 1, 1978. This application Sep. 25, 1978, Ser. No. 945,421

Int. Cl.[2] G11B *21/04*

U.S. Cl. 360—84 **5 Claims**



1. The method of signal recording comprising, moving a recording medium along a predetermined path, rotating a plurality of circularly and axially spaced transducer heads, guiding the tape at an angle to the axis of rotation and to such an angular extent that the heads scan sequentially in helical fashion along separate parallel longitudinal paths of equal width on the record medium, setting the rate of rotation such that a plurality of scans of equal length occur on the separate paths at predetermined spacing, and diverting the signal equally and in predetermined sequence to different ones of said heads.

4,179,718

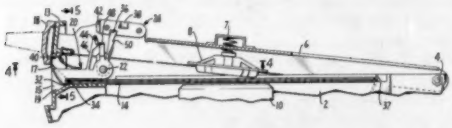
FLEXIBLE MAGNETIC RECORDING DISC DRIVE WITH INTERLOCK TO PROTECT RECORDING DISC CARTRIDGE

Donald L. Rolph, Pleasanton, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Sep. 2, 1977, Ser. No. 830,136

Int. Cl.[2] G11B *5/016*

U.S. Cl. 360—99 **8 Claims**



1. A disc drive for use with an operator-inserted flexible magnetic recording disc cartridge, comprising

means selectively openable and closable for receiving such an inserted cartridge when open and releasably clamping the recording disc contained within said cartridge in a position for recording and playback when said receiving and clamping means is closed,

door means selectively movable between a fully closed position covering and a fully open position exposing access to said receiving and clamping means from outside said disc drive,

interlock means to prevent closing of said door means and said clamping means if an inserted cartridge is only partially inserted, said interlock means comprising

cartridge insertion sensing means for sensing the insertion of a disc cartridge into said receiving and clamping means when said receiving and clamping means is open and for sensing whether said cartridge is fully inserted or not and for providing to the inserting operator a tactile signal when said cartridge is fully inserted, said cartridge insertion sensing means comprising a member which is both mounted for pivotal movement into and out of the path of insertion of said cartridge and which is resiliently urged pivotally into said path of insertion such that insertion of said cartridge into said receiving means forces said cartridge insertion sensing means out of said path of insertion until said cartridge is fully inserted into said receiving means,

means cooperating with said cartridge insertion sensing means for preventing both closing of said receiving and clamping means and engagement between said door means and said cartridge if said inserted cartridge is less than fully inserted whereby the receiving and clamping means and door means may be closed over an inserted cartridge only if that cartridge is fully inserted,

means resiliently urging an inserted said cartridge outwardly of said fully inserted position and cartridge retaining means for releasably retaining a fully inserted said cartridge in said fully inserted position, said cartridge retaining means comprising means adjacent and operatively connected to said cartridge insertion sensing means such that pivotal movement of said cartridge insertion sensing means out of said insertion path will move said retaining means out of the path of insertion and the path of removal of said cartridge and thus out of latching engagement with said cartridge.

4,179,719

THIN FILM MAGNETIC HEAD

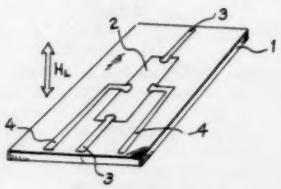
Nobutake Imamura, Tokyo; Yoshinori Mimura, Tachikawa, and Toshihiko Kobayashi, Mitaka, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jan. 25, 1977, Ser. No. 762,232

Claims priority, application Japan, Apr. 28, 1976, 51-48929

Int. Cl.[2] G11B *5/38, 5/22*

U.S. Cl. 360—112 **8 Claims**

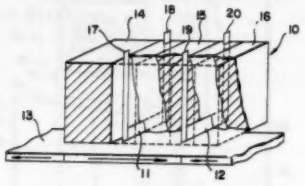


1. A thin film magnetic head comprising: a substrate of insulating material; an amorphous magnetic thin film deposited on the substrate, the amorphous magnetic thin film having a width smaller than each of unit areas of magnetic records on a magnetic recording medium to be separately read out therefrom and having an easy axis of manetization in a direction perpendicular to the film surface; a pair of current terminals formed on the substrate for flowing a current in the amorphous magnetic thin film in the lengthwise direction thereof; and a pair of voltage terminals formed on the substrate for deriving from the amorphous magnetic thin film a voltage induced in the transverse direction thereof.

4,179,720
MAGNETIC RECORDED INFORMATION REPRODUCING APPARATUS

Yoshimasa Miura, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed May 12, 1977, Ser. No. 796,458
Claims priority, application Japan, May 13, 1976, 51-54734
Int. Cl.[2] G11B *5/30, 21/10*
U.S. Cl. 360—113 **10 Claims**



1. A magnetic recorded information reproducing apparatus for reproducing information in accordance with recorded patterns spaced apart on a magnetic recording medium by a minimum spacing, said apparatus comprising:

two magnetoresistive elements having resistance values which vary in accordance with an external magnetic field intensity, and which are disposed in parallel to the direction of said patterns recorded on said magnetic recording medium, and which are spaced apart from each other by a distance shorter than said minimum spacing of the patterns; and

magnetic shield means disposed between said two magnetoresistive elements and on that respective side of each of said magnetoresistive elements remote from the other magnetoresistive element for preventing magnetic coupling between said two magnetoresistive elements;

said magnetic shield means comprising shields disposed in spaced relationship to said magnetoresistive elements so as to form respective air gaps surrounding each magnetoresistive element;

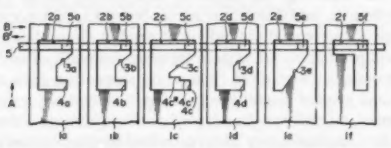
said respective air gaps surrounding each magnetoresistive element comprising insulator means for electrically insulating each of said magnetoresistive elements from the other of said magnetoresistive elements so as to preclude electrical coupling between said magnetoresistive elements;

whereby to provide said apparatus with high resolution for reproducing magnetic recorded information.

4,179,721
TAPE RECORDER HAVING PLAYBACK RETAINING MECHANISM

Akio Nakazono, and Shizuo Nakamura, both of Nagoya, Japan, assignors to Shin-Shirasuna Electric Corporation, Aichi, Japan

Filed Oct. 31, 1977, Ser. No. 847,223
Claims priority, application Japan, Nov. 8, 1976, 51-149881[U]; Nov. 24, 1976, 51-157190[U]; Feb. 18, 1977, 52-19237[U]; Feb. 18, 1977, 52-19238[U]
Int. Cl.[2] G11B *15/04*
U.S. Cl. 360—137 **4 Claims**

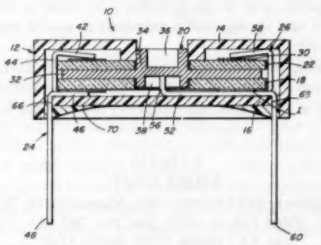


1. An operating mechanism of a tape recorder comprising a play-back lever and at least one of a review lever or a cue lever, each lever capable of being pushed in against a spring bias, and a common slider bar extending transversely to the length of each said lever and slidable in a plane orthogonal to the major surface of each said lever, characterized in that said slider bar is provided with a plurality of projections formed at predetermined intervals and associated with respective ones of said levers, said review lever and said cue lever are formed with inclined edges effective to engage said projections to guide said projections in a predetermined direction when said levers are pushed in, thereby sliding said slider bar in said direction, and restraining recesses effective to restrain said projections to hold said slider bar in said slidden position, said play-back lever is formed with an inclined edge and a restraining recess functionally similar to said inclined edges and said restraining recesses, said restraining recess in said play-back lever is provided with a first and a second stepped portion, so that when said play-back lever is pushed in, said projection associated with said play-back lever may first be restrained by said first stepped portion and in such position, when said review lever or said cue lever is pushed in, said slider bar may be slidden in said direction, whereby said projection associated with said play-back lever may be shifted from said first stepped portion to said second stepped portion and restrained by said second stepped portion, and in this latter position, even if said review lever or said cue lever is pushed in, said slider bar may not be slidden but said play-back lever may be held in said pushed-in position.

4,179,722
SEALED TUNABLE CAPACITOR

John E. Johanson, Boonton, N.J., assignor to Johanson Manufacturing Corporation, Boonton, N.J.

Filed Aug. 17, 1978, Ser. No. 934,357
Int. Cl.[2] H01G *5/06*
U.S. Cl. 361—293 **6 Claims**



1. A sealed tunable disc capacitor comprising:

a tunable capacitor assembly comprising:

a pair of outer dielectric discs;

a central electrically conductive rotor interposed between said outer discs in face-to-face stacked relation;

the ouside of each of said outer discs having an electrically conductive portion in spaced parallel registration with one another;

spring clamp means for retaining said outer dielectric discs in mutually substantially fixed relation and in face-to-face stacked relation with respect to said rotor;

said rotor comprising a flat segmental rotor plate portion and means constraining said rotor to co-axial rotative movement with respect to said dielectric discs;

said spring clamp means comprising an electrically conductive first spring clamp electrode having a base portion electrically and mechanically connected with the electrically conductive portion of one of said dielectric discs and a clamp finger portion electrically and mechanically connected with the electrically conductive portion of the other of said discs;

said spring clamp means further comprising a second electri-

cally conductive spring clamp electrode having contact means abutting a central portion of said rotor through a central opening in one of said dielectric discs and spring finger means overlying and abutting outer surface portions of the other of said dielectric discs at a zone thereof removed from said electrically conductive portion thereof;

a central opening in the other of said dielectric discs;

said rotor being integrally formed with a central post portion having a first axially outwardly-extending portion rotatively journaled in said opening in said one of said dielectric discs and a second axially outwardly-extending portion rotatively journaled in said opening of the other of said dielectric discs;

a recess in the outer end of one of said outwardly extending portions of said rotor post portion, said recess comprising means for sliding interengagement of an adjustment tool having a bit of conforming cross-sectional shape;

a sealed housing for said capacitor assembly comprising:

an upper housing member having a generally cylindrical shape including a top and circular side wall;

a circular opening in said top of said upper housing member of a diameter slightly less than the outside diameter of said rotor post portion, such that one end of said rotor post portion may be frictionally fitted within said opening and recessed within said top to form a friction sealing of said rotor post portion within said upper housing member top, permitting access to said rotor post recess capable of receiving said adjustment tool;

a base housing member to seal said capacitor assembly within said upper housing member, said base housing member having an outside diameter slightly greater than the inside diameter of said upper housing member such that said base housing member may be friction-fitted within said upper housing member;

said base housing member having two diametrically opposed rectangular slots at its periphery to receive the contact leads of said spring clamp members in sealed engagement therewith;

said housing members being fabricated of a semi-rigid, non-conductive plastic material to permit the friction-fitting sealing of said capacitor assembly within said housing.

4,179,723

KIOSK UNIT

Anthony Spencer, 340 Orienta Ave., Mamaroneck, N.Y. 10543

Filed Feb. 4, 1977, Ser. No. 765,682

Int. Cl.[2] H05K *7/20*; B05G *1/00*

U.S. Cl. 361—384 **2 Claims**

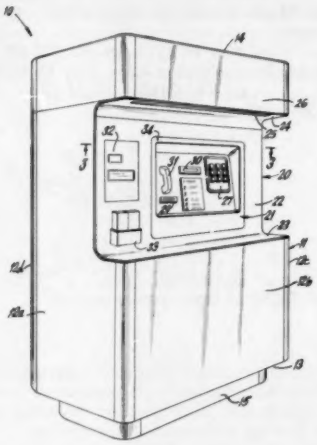
1. A self-contained Kiosk Unit comprises:

a metal frame forming a self-supporting structure including vertical walls, a base and a roof, said frame having a recessed portion extending backwardly from one wall thereof to form a working counter, a vertical wall extending upwardly thereform, controls including communications means, identification means and withdrawal means mounted on said vertical wall and an overhanging portion extending from the recessed vertical wall to the frame wall,

a pedestal upon which the base of said frame is mounted and extends outwardly thereover, said base portion including a predetermined number of perforations to permit a flow of air therethrough into the unit,

a roof having an upper readily removable portion with an aperture therein and a fan mounted within said aperture to direct the flow of air outwardly from the unit and, a lower secure portion fixedly coupled to the frame and extending transversely across the frame in a plane corresponding substantially to the plane of the overhanging portion to restrict access to the interior of the unit, and

a computer unit mounted within the frame with controls mounted on the face of the vertical recessed wall, said computer unit being hinged to the frame in a locked arrangement to permit ready access thereto by authorized personnel.



4,179,724

CABINETS FOR ELECTRICAL OR ELECTRONIC EQUIPMENT

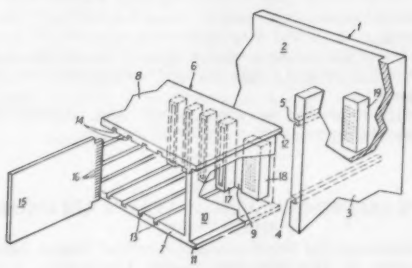
François R. Bonhomme, 6, Parc de Bearn, 92210 Saint Cloud, France

Continuation-in-part of Ser. No. 779,302, Mar. 21, 1977. This application Aug. 31, 1977, Ser. No. 829,440

Claims priority, application France, Apr. 2, 1976, 76 09571

Int. Cl.[2] H02B *1/02*

U.S. Cl. 361—391 **9 Claims**



1. A cabinet for electrical or electronic equipment including lateral walls consisting of a first set of printed circuit board, connector means carried by said printed circuit boards forming said lateral walls, a second set of printed circuit boards adapted for endwise insertion within said connector means which form slides for receiving the edges of said second set of printed circuit boards, said connector means providing electrical connections between said second set of printed circuit boards and said first printed circuit boards forming the walls of said cabinet, complementary slides formed on respective ones of said individual printed circuit boards of said second set, a third set of printed circuit boards adapted for insertion or extraction from the complementary slides provided by spaced ones of said second set of printed circuit boards, contact members adapted to engage respective conducting tracks of said printed circuit boards, and means for insuring that such contact members are

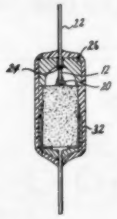
open during insertion or extraction of said printed circuit boards .

4,179,725

CONFORMALLY EPOXY COATED ELECTROLYTE CAPACITOR HAVING AXIAL LEADS

David E. Maguire, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,301
Int. Cl.[2] H01G *9/00*; B01J *17/00*
U.S. Cl. 361—433 **1 Claim**



1. A capacitance device comprising a generally cylindrical solid tantalum anode body having a solder coated end portion of increased outer diameter due to said solder coating and an axially aligned negative lead wire joined thereto, an axially aligned anode riser wire extending from the anode body at the end thereof opposite the negative lead wire, an anode lead wire attached to the anode riser wire by means of a weld, the anode lead wire being substantially in alignment with the riser wire, a generally cylindrically shaped cap member formed of electrically insulative material having outer cross-section dimensions substantially the same as the solder coated end portion of said anode body, and said cap member having an axially aligned passageway which closely, slideably engages said anode lead wire and having an open chamber communicating with said passageway, said open chamber being adjacent said anode body and being adapted to surround said anode riser, said weld and an intermediate portion of said anode lead wire adjacent said weld when slideably moved into contact with said anode body, said cap member being thereby held in axial alignment with said anode body; and a continuous conformal resin coating enclosing said anode body and said cap member in a substantially cylindrical shape and sealing said capacitor body and enclosing within said open chamber said anode riser, said weld and said intermediate portion of said anode wire adjacent said weld, said resin coating being formed in situ by the solidification of a surrounding coating of fluid resin in contact with said anode body and said cap member, said cap member being slideably moved into contact with said anode body prior to solidification of the resin.

4,179,726

BARN DOOR LAMP ATTACHMENT

Daniel L. Aron, Northridge, Calif., assignor to Mole-Richardson Co., Hollywood, Calif.

Filed Sep. 19, 1977, Ser. No. 834,331
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—17 **10 Claims**

1. An attachment for a lamp comprising:

a frame including a flat centerpiece that is substantially square in outline and dimensioned to surround a light bulb, a circular opening defined by said centerpiece, said opening being of sufficient diameter to expose substantially the entire face of said light bulb, and four sidepieces rigidly and immovably attached to the edges of said centerpiece, arranged perpendicular thereto and connected to each other in a box-like manner;

at least four resilient retaining tabs each of which is integrally formed with one of said sidepieces extending inwardly therefrom and away from said centerpiece to releasably retain the front end of said light bulb between said tabs and said centerpiece;

a pair of light blocking barn door panels;

hinge means for pivotably attaching each of said panels to one of said sidepieces;

a pair of opposing, parallel, resilient plates extending from two of said sidepieces away from said retaining tabs, said plates having slots therein; and

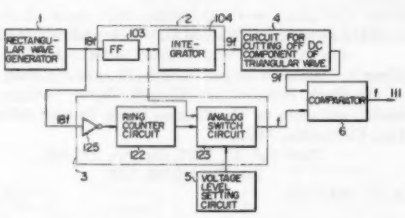
a means for modifying the light from said lamp inserted in said slots and thus releasably held by said plates across said opening overlying the face of said bulb.

4,179,727

CONTROL DEVICE FOR A PULSE-WIDTH MODULATED INVERTER

Nobuyoshi Muto; Yasuo Matsuda, and Kazuo Honda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 18, 1977, Ser. No. 852,980
Claims priority, application Japan, Dec. 1, 1976, 51-143361
Int. Cl.[2] H02M *7/515*
U.S. Cl. 363—41 **6 Claims**



1. A control device for a pulse-width modulated inverter comprising means for generating as a carrier wave a triangular wave synchronizing with an AC output from the inverter, means for generating as a modulating wave a train of rectangular wave pulses which synchronize with said triangular wave and have a width corresponding to a section effective for a modulating operation and a predetermined amplitude, voltage level setting means for setting the amplitude of said train of rectangular wave pulses, and means for modulating said triangular wave with said train of rectangular wave pulses and generating a control pulse for said AC output.

4,179,728

CAPACITOR CHARGING CIRCUIT

Sherman J. Pirkle, Waltham, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 3, 1977, Ser. No. 839,076
Int. Cl.[2] H02M *3/24*; H02J *15/00*
U.S. Cl. 363—59 **13 Claims**

1. Apparatus for charging a capacitor with energy from a direct current energy source comprising,

an inverter energized by said source so as to produce an alternating current voltage,

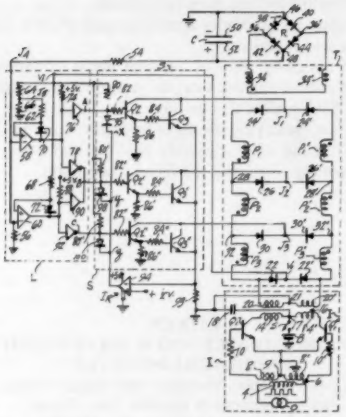
a transformer coupled to said inverter,

a rectifier coupled to said transformer,

means coupling said rectifier to said capacitor, and

control means responsive to the voltage on said capacitor for

changing the turns ratio of said transformer from one value to another so as to increase the voltage coupled to



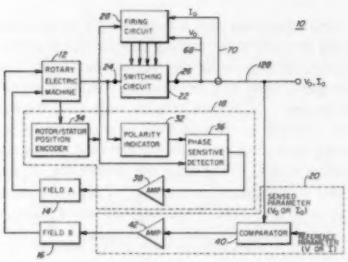
said rectifier when the voltage on said capacitor increases through predetermined levels.

4,179,729

ROTARY ELECTRIC MACHINE AND POWER CONVERSION SYSTEM USING SAME

William E. Stanton, Newton; David B. Eisenhaure, Hull; George A. Oberbeck, Belmont, and Kenneth Fertig, Sudbury, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 15, 1977, Ser. No. 787,930
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—175 **21 Claims**



1. A rotary electrical machine for use in power conversion between a higher frequency power signal and a lower frequency power signal including: a rotor; a stator; an armature; and first and second independently controllable field windings in spatial quadrature for selectively shaping the back EMF waveform of the machine to control the amplitude and phase relation of the voltage and current outputs of the machine;

a first field control circuit responsive to the phase difference between the voltage and current of the higher frequency signal generated in the armature winding of the machine for driving said first field winding to minimize said phase difference;

a second field control circuit for monitoring the amplitude difference between a selected one of the voltage and current parameters of said lower frequency signal and a reference level for driving said second field winding to adjust that load signal amplitude toward said reference level; and

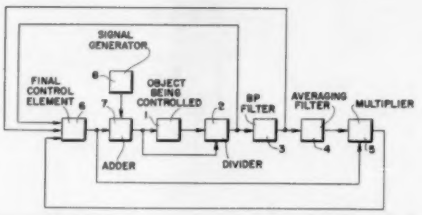
switching means responsive to said higher frequency signal and said lower frequency signal for selectively transferring power between said higher and lower frequency signals.

4,179,730

SELF-OPTIMIZING CONTROL SYSTEM FOR OBJECT WITH UNIMODAL QUALITY FUNCTION

Boris M. Antonov, Khimki Moskovskoi oblasti; Viktor V. Vasiliev, and Sergei I. Pischikov, both of Moscow, all of U.S.S.R., assignors to Institut vysokikh temperatur Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Mar. 29, 1978, Ser. No. 891,226
Claims priority, application U.S.S.R., Apr. 8, 1977, 2476357
Int. Cl.[2] G05B *13/02*
U.S. Cl. 364—105 **1 Claim**



1. A self-optimizing control system for an object with a unimodal quality function, comprising:

an input of said object being controlled; an output of said object being controlled; a divider having inputs and an output and connected with one of its inputs to said output of said object being controlled, and with its other input to said input of said object being controlled; an adder having inputs and an output and connected with its said output to said input of said object being controlled; a search signal generator having an input and an output and connected with said output to one of said inputs of said adder; a final control element having inputs and an output and connected with said output to another of said inputs of said adder; a band-pass filter having an input and an output and connected with said input to said output of said divider and with said input to a first of said inputs of said final control element; an averaging filter having an input and an output and connected with said input to said output of said band-pass filter and with said input to a second of said inputs of said final control element; a multiplier having inputs and an output of said averaging filter, with another of said inputs to said output of said final control element, and with said output to the third of said inputs of said final control elememt.

4,179,731

MICROPROGRAMMED CONTROL SYSTEM

Isamu Yamazaki, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 4, 1977, Ser. No. 784,459
Claims priority, application Japan, Apr. 2, 1976, 51-36073
Int. Cl.[2] G06F *9/16, 9/20*
U.S. Cl. 364—200 **6 Claims**

1. A microprogrammed control system comprising:

a first memory for storing a microprogram having ordinary and branch instructions, the branch instruction including an operation code, a control code and an address, said first memory including an address input port;

a second memory for storing instructions, which includes an address input port;

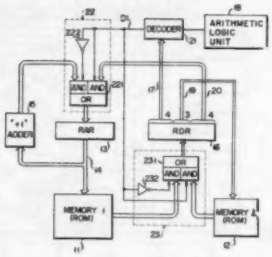
an address register for storing an address of an instruction to be next executed, which includes an input port;

address updating means for updating the address in the address register to a further next instruction;

an instruction register for storing a currently executed instruction, which includes an input port;

first means connected to the instruction register for generating a first signal when the instruction in the instruction register is the ordinary instruction and a second signal when the instruction is the branch instruction;

second means connected to the first means and responsive to the first signal for transferring the instruction to be next executed which corresponds to the address in the address register from the first memory to the input port of the instruction register and for transferring the update address



of the address updating means to the address input port of the address register; and

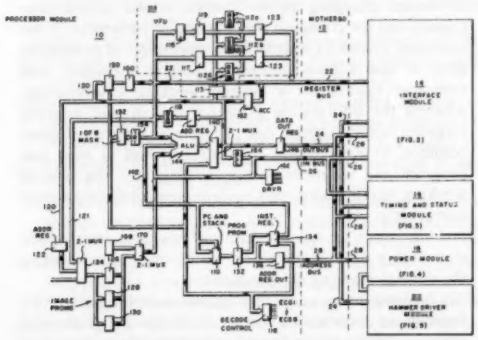
third means connected to the first means and responsive to the second signal for transferring the branch address designated by the branch instruction into the address input port of the address register and for transferring an instruction designated by the control code of the branch instruction in the instruction register from the second memory to the input port of the instruction register, said branch address and said instruction from the second memory being stored in the address register and the instruction register in response to a clock pulse.

4,179,732

MICROPROGRAMMABLE PROCESSOR CONTROL PRINTER SYSTEM

Sultan W. Khan, West Lake; John K. Ham, Simi, and Richard A. Strissel, Simi Valley, all of Calif., assignors to DataProducts Corporation, Woodland Hills, Calif.

Filed Jun. 10, 1977, Ser. No. 805,527
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—200 **19 Claims**



1. A printer controller operable in a plurality of modes for interrogating and controlling a printer mechanism, comprising:

a plurality of buses;

interface means, coupled to at least one of said buses, for interfacing a data source to said at least one bus, said interface means including circuitry for receiving digital data and commands from that data source, said interface means also providing status and fault indicating signals indicative of operating conditions of said interface means;

timing and status means, coupled to at least one of said buses, for generating timing, status and fault indicating signals indicative of operating parameters of said printer mechanism;

printer mechanism actuating means, coupled to at least one of said buses, for receiving actuating signals from at least one of said buses and for actuating said printer mechanism in response thereto so as to produce formatted hardcopy printout, said printer mechanism actuating means also providing status and fault indicating signals indicative of operating conditions of said printer mechanism actuating means; and

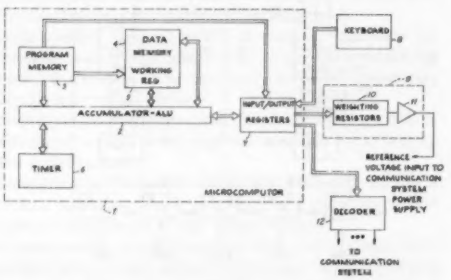
a programmable central processor, coupled to said buses, (a) for manipulating said digital data to generate said actuating signals for said printer mechanism actuating means, (b) for controlling said interface means, said timing and status means and said printer mechanism actuating means, and (c) for interrogating status and fault indicating signals in said interface means, said timing and status means, and said printer mechanism actuating means so as to provide in response thereto a plurality of condition indicating signals and diagnostic signals indicative of fault detection.

4,179,733

COMPUTER FOR CONTROL OF COMMUNICATION SIGNALS

Edward A. Launzel, 1501 Broadway, New York, N.Y. 10036, and Gordon Silverman, New York, N.Y., assignors to Edward A. Launzel, New York, N.Y.

Filed Aug. 25, 1977, Ser. No. 827,608
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—200 **4 Claims**



1. A device for controlling a communication system having a sequence of operation, said device comprising:

program memory means including a plurality of previously stored sequences of binary qunatities for control of said sequence of operation of said device;

accumulator-ALU means connected to said program memory means wherein both calculations and comparisons of binary quantities occur;

data memory means connected to said accumulator-ALU and to said program memory means wherein results of said both calculations and comparisons are stored as an independent and a second sequence of binary quantities;

timer means connected to said accumulator-ALU means wherein signals are produced at a fixed predetermined rate;

input/output register means having a multiplicity of inputs and outputs connected to said accumulator-ALU means and to said program memory means wherein said plurality of previously stored sequences of binary quantities and said second sequence of binary quantities are transmitted between the said accumulator-ALU means and other elements of said device, such other elements including:

a. keyboard means connected to said input/output register

means wherein a third sequence of binary quantities may be generated by a user for purpose of comparision with one of said plurality of previously stored sequences of binary quantities, such comparison being stored as part of said second sequence of binary quantities;

b. D/A converter means connected to one of said multiplicity of outputs of said input/output register means such that said second sequence of binary quantities produces a unique potential in said D/A converter means, such unique potential actuating said communication system;

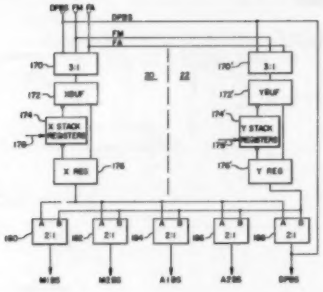
c. decoder means connected to another of said multiplicity of outputs of said input/output register means such that said second sequence of binary quantities produces a predetermined voltage on one of a multiplicity of control lines, such predetermined voltage actuating the frequency at which said communication system is to operate.

4,179,734

FLOATING POINT DATA PROCESSOR HAVING FAST ACCESS MEMORY MEANS

George P. O'Leary, Beaverton, Oreg., assignor to Floating Point Systems, Inc., Portland, Oreg.

Division of Ser. No. 702,148, Jul. 2, 1976, Pat. No. 4,075,704. This application Oct. 31, 1977, Ser. No. 846,889
Int. Cl.[2] G06F *13/06*
U.S. Cl. 364—200 **9 Claims**



1. A data processor including arithmetic means and memory register means comprising a data pad, said data pad comprising:

an input register,

an output register,

a plurality of stack registers,

means for individually addressing said stack registers for writing in and reading out information, wherein said means for addressing includes a first address register for storing a data pad base address and means for adding that base address to an index or relative address for selecting among a group of stack registers designated by said data pad address, and further including means for changing said data pad address in said first address register,

means for coupling said input register to an addressed stack register for writing in information,

means for normally coupling said output register to an addressed stack register for reading out information,

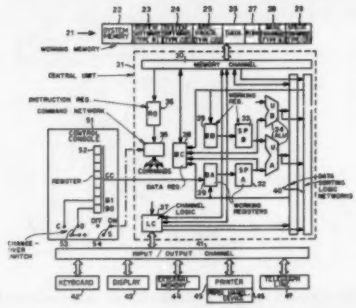
and means for selectively coupling said output register to read out information from said input register when information is addressed for read out next after writing in of the same information.

4,179,735

COMPUTER WITH AN ARRANGEMENT FOR CHANGING ITS WORKING ENVIRONMENT

Franco Lodi, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Apr. 4, 1977, Ser. No. 784,430
Claims priority, application Italy, Apr. 22, 1976, 67965 A/76
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—200 **5 Claims**



1. A computer system for processing data under control of different selectable information groups each corresponding to a different working environment, each information group being defined by an operating system program, at least one application program and a plurality of microprograms associated with the operating system and application programs, said computer system including a working memory for storing an information group, a central processing unit controlled by the information group stored in said working memory for processing data and a plurality of peripheral units selectively connectable to said central processing unit according to the operating system program of the information group stored in said working memory, said plurality of peripheral units being controlled by said central processing unit in accordance with the application program of the information group stored in said working memory, said plurality of peripheral units including an external memory for storing a plurality of information groups corresponding to different working environments, the improvement comprising:

environment changing means coupled to said central processing unit for changing the working environment of the computer system by selectively connecting said peripheral units to said central processing unit to specialize said computer system for a desired working environment, wherein the information groups stored in said external memory include at least one program and microprogram common to all working environments and at least one program and microprogram specialized for the desired working environment, said environment changing means comprising:

switching means having a plurality of positions each associated with a different working environment for selecting the desired working environment;

group forming means controlled by said switching means for forming an information group from the programs and microprograms stored in said external memory including the programs and microprograms common to all working environments and the programs and microprograms specialized for the desired working environment; and

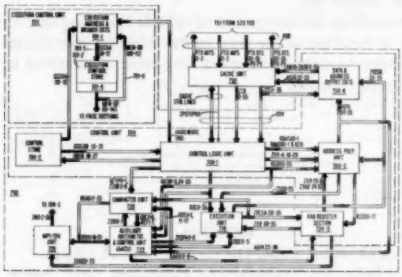
loading means coupled to said group forming means and responsive to said switching means for introducing the information group formed by said group forming means into said working memory.

4,179,736

MICROPROGRAMMED COMPUTER CONTROL UNIT CAPABLE OF EFFICIENTLY EXECUTING A LARGE REPERTOIRE OF INSTRUCTIONS FOR A HIGH PERFORMANCE DATA PROCESSING UNIT

John E. Wilhite, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 22, 1977, Ser. No. 853,946
Int. Cl.[2] G06F 9/16
U.S. Cl. 364—200 41 Claims



1. A data processing system for performing data manipulations under the control of instructions, said system including buffer storage apparatus, instruction processing apparatus and instruction execution apparatus, said instructions being processed in a pipelined fashion by said instruction processing apparatus during a number of different successive phases of operation to completion, said instruction processing apparatus comprising:

a plurality of registers for storing instructions to be processed received from said buffer storage apparatus, each instruction including an operation code having a first number of bits;

a first addressable control store coupled to a first one of said plurality of registers for receiving signals corresponding to an operation code of an instruction to be processed, said first control store including a plurality of locations, each for storing a word including at least a control sequence code and an address, said control sequence code including a second number of bits which is less than said first number of bits coded for specifying one of a number of hardwired control sequences and said address identifying a first microinstruction of a different one of a plurality of execution sequences and an output register connected to said store for storing the word contents of a location specified by said operation code;

control sequence decode circuit means coupled to said first control store output register for decoding signals corresponding to said control sequence code; and,

hardware control sequencing means coupled to said sequence decode circuit means for generating sequences of control signals in response to said signals for defining the operations to be performed during selected ones of said different successive phases;

said first control store being conditioned in response to said signals corresponding to each operation code of an instruction stored in said first register to read out the contents of a predetermined one of said plurality locations into said first control store output register and

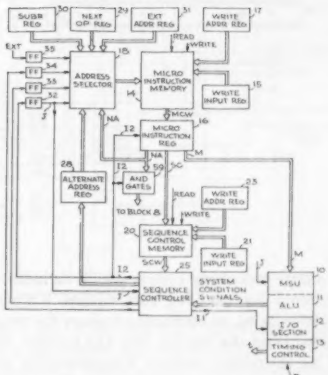
said decode circuit means in response to said control sequence code conditioning said hardware control sequencing means for generating a predetermined sequence of said control signals for enabling the completion of the operations of as many of said selected ones of said different successive phases under hardwired control before transferring control to said first microinstruction of one of said plurality of execution sequences specified by said address read out from said predetermined location of said first control store.

4,179,737

MEANS AND METHODS FOR PROVIDING GREATER SPEED AND FLEXIBILITY OF MICROINSTRUCTION SEQUENCING

Dongsung R. Kim, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1977, Ser. No. 864,150
Int. Cl.[2] G06F 9/20
U.S. Cl. 364—200 16 Claims



1. In a cyclically operating microprogrammed data processing system having a plurality of possible states indicating system conditions and wherein a cycle corresponds to the time between clock pulses, the combination comprising:

microinstruction memory means for storing selectively addressable microinstruction control words each containing a microinstruction to be executed and an accompanying sequencing control portion;

microinstruction memory output means for storing a microinstruction control word read out from said microinstruction memory means;

microinstruction execution means for executing during a cycle a microinstruction contained in a microinstruction control word stored in said output means;

addressing means operable concurrently with said execution means during a cycle for addressing said microinstruction memory means so as to read out a next microinstruction control word therefrom for storage in said output means; and

sequencing control means operable concurrently with said execution means and said addressing means during a cycle, said sequencing control means being responsive to a sequencing control portion stored in said output means during a cycle and the states of selected system conditions for providing during the same cycle a microinstruction control indication, and a plurality of inhibit indications;

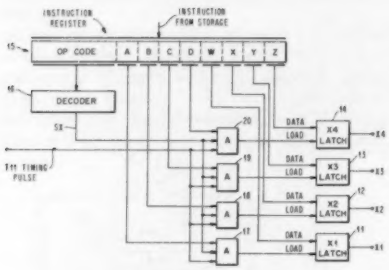
said sequencing control means including logic circuit means responsive to said inhibit indications for selectively controlling storage in said output means of a microinstruction control word read out of said microinstruction memory means and also selectively controlling execution of the microinstruction contained in said output means during a current cycle and during the next occuring cycle;

said logic circuit means being responsive to said microinstruction control indication when it is of a first type for controlling the addressing provided by said addressing means in the next cycle and when it is of a second type for modifying the operations provided by said logic circuit means in response to said inhibit indications.

4,179,738
PROGRAMMABLE CONTROL LATCH MECHANISM FOR A DATA PROCESSING SYSTEM

Peter T. Fairchild, and Joel C. Leininger, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,223
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—200 5 Claims



1. In a data processing system which includes various data flow elements for handling data signals, a storage unit for storing instructions, an instruction register for receiving stored instructions from the storage unit and control circuitry coupled to the instruction register for controlling the data flow elements and the reading of instructions from the storage unit, a programmable control latch mechanism comprising:

a latch circuit having a data input for receiving a binary data signal, a load input for receiving a load signal for causing the binary data signal to be loaded into the latch circuit and at least one output for providing a control signal for the data processing system;

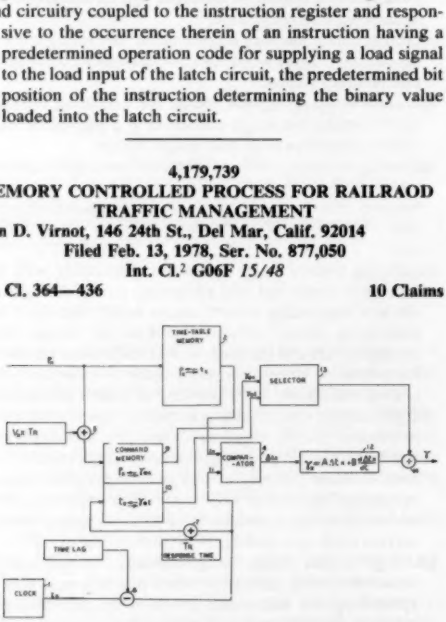
circuitry for coupling the data input of the latch circuit to a predetermined bit position of the instruction register;

and circuitry coupled to the instruction register and responsive to the occurrence therein of an instruction having a predetermined operation code for supplying a load signal to the load input of the latch circuit, the predetermined bit position of the instruction determining the binary value loaded into the latch circuit.

4,179,739
MEMORY CONTROLLED PROCESS FOR RAILRAOD TRAFFIC MANAGEMENT

Alain D. Virnot, 146 24th St., Del Mar, Calif. 92014

Filed Feb. 13, 1978, Ser. No. 877,050
Int. Cl.[2] G06F *15/48*
U.S. Cl. 364—436 10 Claims



1. A method for regulating the flow of vehicular traffic over a network of interconnected itineraries travelled by a plurality of vehicles which comprises:

(a) defining at least one time-table for each vehicle over each itinerary to be travelled by said vehicle;

(b) storing said time-table on board said vehicles;

(c) assigning to each vehicle a time-table and a time-lag in coordination with the time-tables and time-lags assigned to other vehicles scheduled to travel over said network; on board each vehicle Hx,

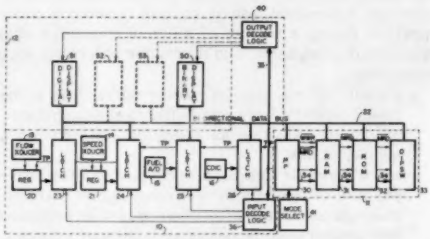
(d) continuously reckoning the location coordinates px of said vehicle Hx;

(e) controlling the movement of vehicle Hx along said itinerary in function of the time of day and the coordinates px in order to meet its assigned time-table as modified by its assigned time-lag.

4,179,740
VEHICLE PERFORMANCE ANALYZER

John R. Malin, 215 Eastridge La., Escondido, Calif. 92026

Filed Sep. 2, 1977, Ser. No. 830,171
Int. Cl.[2] G01M *15/00*
U.S. Cl. 364—442 25 Claims



1. A user calibratable vehicle performance system comprising:

a plurality of on-board sensing means including speed measuring means for generating a digital representation of the instantaneous vehicle speed;

flow measuring means for generating a digital representation of the instantaneous fuel consumption of the vehicle;

fuel gauge means for generating a digital representation of the amount of fuel remaining in the vehicle fuel supply;

digital computer means responsive to the output of said speed measuring means, said flow measuring means and said fuel gauge means for computing instantaneous miles per gallon of fuel consumption and miles to the end of the vehicle fuel supply;

and manually operated calibration means coupled to said computer means for inputting actual data observed by the user at a series of sets of conditions;

said manually operated calibration means including manually controlled means for introducing into said digital computer observed data in numerical form;

said digital computer responding to said sensing means and the numerical input for generating and displaying a binary signal representative of the calibration constant to be stored in the memory of said digital computer;

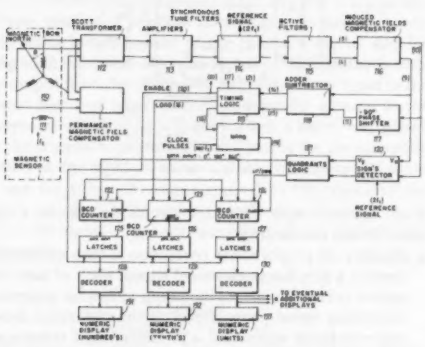
said manually operated calibration means including a plurality of user operated binary switches for matching the display to input calibration data to the memory of said computer.

said computer means thereafter operative to calculate vehicle performance as a function of said calibration values.

4,179,741
MAGNETIC COMPASSES

Aldo Rossani, Rome, Italy, assignor to C.I.E.R. Compagnia Importazioni Esportazioni Rappresentanze S.R.L., Rome, Italy

Filed Aug. 8, 1977, Ser. No. 822,415
Claims priority, application Italy, Aug. 26, 1976, 51036 A/76
Int. Cl.[2] G01C *17/28;* G06F *15/20*
U.S. Cl. 364—457 5 Claims



1. In a static compass system for indicating the head-angle error with respect to a selected head angle by taking into consideration the deviation:

(a) a magnetic sensor which generates sensor analog signals corresponding to the horizontal orthogonal components of the earth's magnetic field and the permanent and induced perturbing magnetic fields which it senses;

(b) analog circuit means for receiving said analog signals and generating analog head-angle signals, said analog circuit means including means for eliminating the deviation in heading in accordance with the Poisson equations;

(c) first digital circuit means receiving said analog head-angle signals from said analog circuit, said first digital circuit means comprising:

(i) converter means for converting said analog signals into digital signals;

(ii) counting means for quantifying the signal output from said converter means;

(iii) memory and decoder means for storing and decoding the signal output from said counting means and generating decoded head-angle signals; and

(iv) digital indicator means for receiving the decoded head-angle signals and displaying a decoded head angle corresponding thereto;

(d) selector circuit means in which a selected head angle can be manually entered and which provides an encoded signal corresponding thereto;

(e) a second digital circuit means comprising a comparator for comparing the decoded head-angle signal received from said first digital circuit means with said selected head-angle signal received from said selector circuit means and for supplying an error angle signal in accordance with said comparison;

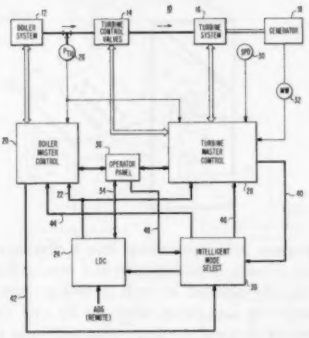
(f) counter means for quantifying said error angle signal; and

(g) display means for receiving said error angle signal and visually displaying an error angle corresponding thereto.

4,179,742
SYSTEM FOR INTELLIGENTLY SELECTING THE MODE OF CONTROL OF A POWER PLANT

Louis P. Stern, Wadsworth, Ohio, and Steven J. Johnson, McCandless Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1978, Ser. No. 894,073
Int. Cl.[2] G05B *15/02;* F01D *17/02*
U.S. Cl. 364—494 10 Claims



1. In a steam turbine power plant having a boiler for generating steam to a steam turbine which is mechanically coupled to an electrical generator which generates electrical energy at a desired power generation level and including a boiler master controller for controlling boiler firing rate, said boiler controller being operative to generate a first plurality of status signals representative of plant control status; a turbine master controller for controlling a plurality of turbine steam admission valves, said turbine controller being operative to generate a second plurality of status signals representative of plant control status; said boiler and turbine master controllers being concurrently operative in one of a boiler follow and turbine follow control mode; and selecting means for switching the mode of control of said power plant between said boiler follow and turbine follow modes, a system for governing said selecting means comprising:

means for governing said selecting means to switch power plant control to said boiler follow control mode in accordance with a first set of predetermined plant control conditions established from said generated first and second plurality of status signals; and

means for governing said selecting means to switch power plant control to said turbine follow control mode in accordance with a second set of predetermined plant control conditions established from said generated first and second plurality of status signals.

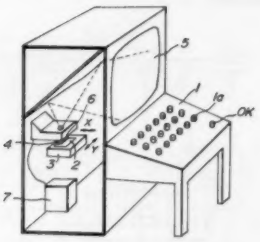
4,179,743
AUTOMATIC MICROFILM RETRIEVAL SYSTEM

Takeomi Suzuki, Tokyo, and Asao Hayashi, Hachioji, both of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,164
Claims priority, application Japan, Jul. 25, 1977, 52-88270; Jul. 26, 1977, 52-89421; Aug. 23, 1977, 52-100121
Int. Cl.[2] G06F *15/02;* G03B *23/08*
U.S. Cl. 364—518 7 Claims

1. In an automatic microfilm retrieval system comprising a stage movable in X and Y directions, a microfilm disposed on said stage and bearing contents of a dictionary or the like recorded thereon, an optical system and reading head arranged above and opposed to said microfilm, a screen and a key board provided thereon with a number of keys corresponding to index words to be retrieved, a microfilm portion corresponding to index words selected by depressing said keys being

projected on said screen, the improvement comprising a retrieval cord recorded on said microfilm, the surface of said microfilm being divided into a plurality of unit regions to be displayed on said screen at the same time, a cord added to each of said unit regions and representing an index word whose contents are included in each of said unit regions, a plurality of



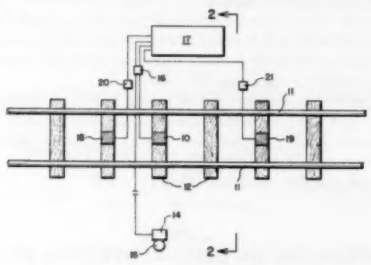
said unit regions being assembled into a plurality of groups, cords added to each of said groups and representing first and last index words included in each of said groups, and a subtracter comparing said cords read out by said reading head with key inputs obtained by depressing said keys and controlling movements of said stage and retrieving said microfilm disposed thereon.

4,179,744

METHOD AND APPARATUS FOR ANALYZING PERFORMANCE OF ELECTRIC-TRACTION-MOTOR POWERED VEHICLES AND ELECTRICAL OPERATING COMPONENTS THEREOF

Carl W. Lowe, Milford, Utah, assignor to Magtronics Incorporated, Milford, Utah

Filed Mar. 2, 1978, Ser. No. 882,864
Int. Cl.[2] G06F *15/20*; G01R *33/02*
U.S. Cl. 364—551 **13 Claims**



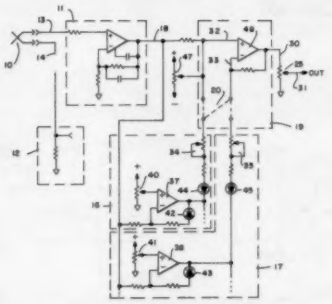
7. A power propulsion system performance analyzer for vehicles having electric traction motors, comprising a pathway for vehicle travel; stationary sensing means located in proximity to said pathway and positioned to sense magnetic fields produced by at least one selected operating electrical component of the propulsion systems of respective ones of said vehicles as they pass said sensing means and to produce respective signals in response to and indicative of the magnetic fields sensed; and means for processing said signals to produce respective perceptible outputs representative of said magnetic fields and indicative in general of performance of respective electrical operating components of the vehicle whose magnetic fields were sensed and of any maintenance work that must be done to maintain optimum operating performance.

4,179,745

THERMOCOUPLE LINEARIZER CIRCUIT

James W. Wuertele, Sunnyvale, Calif., assignor to Gentran, Inc., Sunnyvale, Calif.

Filed May 30, 1978, Ser. No. 910,766
Int. Cl.[2] G01K *7/14*
U.S. Cl. 364—571 **8 Claims**



2. A thermocouple linearizer circuit for use in a digital display device comprising:

a plurality of proportional correction means connected to receive a non-linear electrical signal, each of said linearization correction means including means for generating a correction signal proportional to the difference between said non-linear signal and a predetermined reference signal, said linearization correction signals being generated when said non-linear signal exceeds said reference signal, and

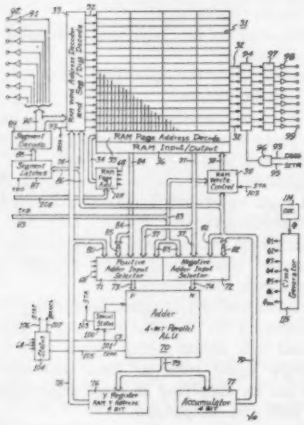
arithmetic means for adding said correction signals and said non-linear signals thereby forming a linear signal corresponding to the temperature of said thermocouple.

4,179,746

DIGITAL PROCESSOR SYSTEM WITH CONDITIONAL CARRY AND STATUS FUNCTION IN ARITHMETIC UNIT

Graham S. Tubbs, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1976, Ser. No. 706,711
Int. Cl.[2] G06F *7/50, 13/00*
U.S. Cl. 364—900 **9 Claims**



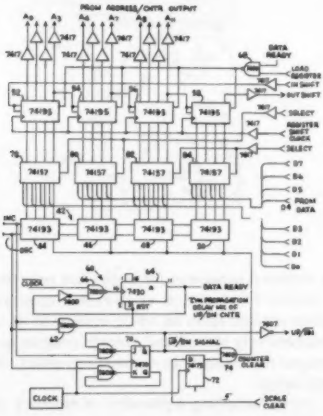
1. An electronic digital processor system of the type implemented in a semiconductor LSI device, said system having a

bit-parallel arithmetic unit with first and second inputs and an output, the arithmetic unit performing during a machine cycle arithmetic and logic operations on digits of numerical information applied to said inputs, one digit being produced at said output for each machine cycle, each digit having a plurality of parallel bits, memory means having input/output means and having a plurality of memory locations, addressing means associated with the memory means for selecting in response to command signals one of the plurality of memory locations for storing digits of numerical information in the memory means via the input/output means or recalling such information from the memory means via the input/output means, selector means coupled to the first and second inputs of the arithmetic unit for selecting in response to command signals any one of a plurality of different sources of digits of numerical information including said input/output means of the memory means and for applying such information to said inputs of the arithmetic unit, a carry output from the arithemtic unit and a carry input to the arithmetic unit, and logic means for applying a carry to the carry input in response to whether or not a carry was generated in the arithmetic unit at the carry output for the operation performed on the digits of numerical information by the arithmetic unit for either the digits applied to the inputs of the arithmetic unit during the current machine cycle or the digits applied to the inputs of the arithmetic unit during the previous machine cycle.

4,179,747
MAILING SYSTEM

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 750,534, Dec. 14, 1976, Pat. No. 4,131,946. This application Jul. 24, 1978, Ser. No. 927,705
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—900 **3 Claims**

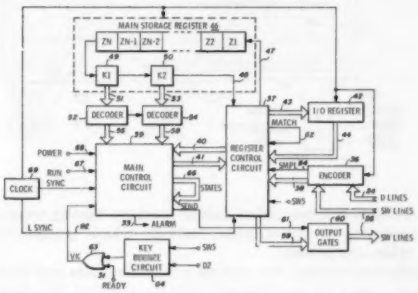


1. An interface for providing selective information transfer channels between a processing unit, a memory and a peripheral, the interface comprising register means for storing and transferring information, the register means including means for receiving information in a parallel mode and means for transferring information in a parallel mode, the parallel mode transfer means being adapted to address the memory and the parallel receiving means being adapted to load memory information into the register means, the processing unit including means for simultaneous serial loading of address information into the register means and serial unloading of memory information from the register means, the register means being thereby adapted to effect reduced cycle time.

4,179,748
PROGRAMMER AND METHOD OF STORING INFORMATION THEREIN AND ACCESSING INFORMATION THEREFROM

Floyd P. Brown, Santa Clara, and Peter D. Narvaez, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 587,284, Jun. 16, 1975, abandoned. This application May 22, 1978, Ser. No. 908,062
Int. Cl.[2] G06F *3/02*
U.S. Cl. 364—900 **9 Claims**



1. A programmer adaptor module for converting a non-programmable calculator into a programmable calculator, said non-programmable calculator including an arithmetic-logic unit connected via a bus to a keyboard, said keyboard operating to generate key-closure signals on said bus representative of the respective keys thereon as they are manually pressed, and said arithmetic-logic unit operating to receive said key-closure signals from said bus and to take predetermined action in response thereto; wherein said programmer adaptor module includes:

digital encoder means for connection to said bus to receive said key-closure signals and for encoding said key-closure signals into sequences of digital words representative of the sequence in which said keys are manually depressed;

digital memory means for storing therein and for subsequently retrieving therefrom said sequences of digital words;

means for generating mode control logic signals;

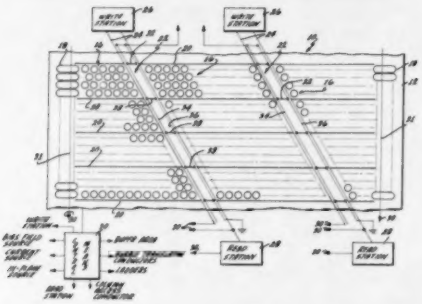
memory input control means having first inputs connected to said encoder for receiving said digital words therefrom, second inputs for receiving said logic signals, and coupled to said digital memory means for storing therein said sequences of digital words when said logic signals are in a first predetermined state; and

memory output control means having first inputs connected to said encoder for receiving said digital data words therefrom, second inputs for receiving said logic signals, and coupled to said digital memory means for retrieving therefrom portions of said sequences of data words starting with a first predetermined word and ending with a second predetermined word and for generating simulated key-closure signals on outputs for connection to said bus to simulate the closing of said keys in the sequence represented by said retrieved portion of words in response to receiving predetermined digital words from said encoder means when said logic signals are in a second predetermined state.

4,179,749
DEFECT TOLERANT SCHEME FOR A BUBBLE LATTICE FILE

Robert L. Zwingman, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 23, 1978, Ser. No. 918,477
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—3 19 Claims



1. A defect tolerant lattice bubble memory having structure for supporting arrays of lattice bubbles which interact with each other comprising,

confinement means for confining lattice bubbles and including means for moving said bubbles in a first direction in said confinement means,

access means for accessing said lattice bubbles within said confinement means,

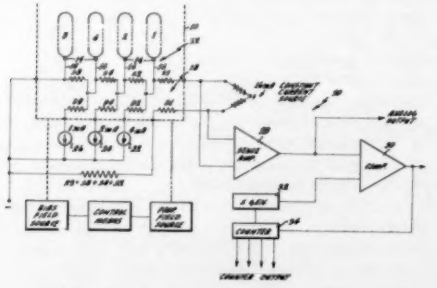
said access means including second confinement means for supporting and confining selected lattice bubbles apart from other lattice bubbles and wherein said lattice bubbles can move in a second direction and means for moving said lattice bubbles in said second direction, and

annihilating means located within said second confinement means for annihilating a predetermined number of lattice bubbles while in said second confinement means.

4,179,750
MAGNETIC BUBBLE TYPE D/A CONVERTER

Farooq M. Quadri, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 13, 1978, Ser. No. 895,991
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—8 11 Claims



1. A digital-to-analog magnetic domain converter comprising:

a domain propagation structure including magnetic elements disposed in an arrangement on which magnetic domains propagate in response to a rotating in-plane magnetic field,

the arrangement including a predetermined number of storage loops positioned in a predetermined order and having a predetermined number of magnetic elements on which said domains circulate, said domains, or the absence of said domains, on said magnetic elements in said storage loops representing weighted binary bits due to the predetermined order position of said storage loops,

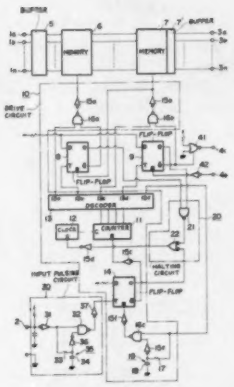
means for transferring said weighted binary bits out of each of said storage loops in parallel as a weighted binary number, and

means for receiving and sensing said transferred bits and converting same into electrical signals the magnitude of which depends upon their binary weight to represent a weighted binary number.

4,179,751
MEMORY APPARATUS FOR DISASTER PREVENTING SYSTEM

Akio Adachi, Kawasaki, Japan, assignor to Hockiki Corporation, Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,797
Claims priority, application Japan, Nov. 24, 1977, 52-139820
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—228 3 Claims



1. In a memory apparatus for a disaster preventing system which is disposed to serve as an interface apparatus wherein alarm signals applied from an alarm system to its input terminals are successively stored and stored contents are delivered from its output terminals to an external computer, the improvement comprising:

a main circuit including a plurality of memory circuits connected in cascade between said input terminals and said output terminals so as to successively store alarm signals;

a plurality of flip-flop means each disposed to be operatively associated with one of said memory circuits whereby when each said flip-flop means is in a set state write operation of said associated memory circuit is disabled, and when each said flip-flop means is in a reset state write operation of said associated memory circuit is enabled;

a drive circuit whereby each time a control signal is received from said alarm system upon application of an alarm signal to said input terminals, one cycle of write operation of each of said memory circuits and the following setting of associated one of said flip-flop means is effected sequentially in the order of the arrangement thereof from said input terminal side to said output terminal side;

a halting circuit disposed to disable the operation of said drive circuit irrespective of the application of a control signal when each of said flip-flop means is in a set state;

means whereby each time one of said memory circuits performs a write operation, said flip-flop means associated with said memory circuit preceding said one memory circuit is reset;

means responsive to an end-of-interruption signal from said computer to reset said flip-flop means associated with final-stage one of said memory circuits which is nearest to said output terminals; and

means disposed to apply an interruption signal to said computer when said final-stage flip-flop means is set;

whereby when an alarm signal is applied to said input terminals, said alarm signal is shifted sequentially from first-stage one of said memory circuits to the following ones thereof until said alarm signal is stored in said final-stage memory circuit, thereby a plurality of alarm signals applied sequentially in time to said input terminals are sequentially stored in said memory circuits in a manner that the first one of said alarm signals is stored in said final-stage memory circuit.

DESIGN PATENTS

GRANTED DEC. 18, 1979

ERRATA

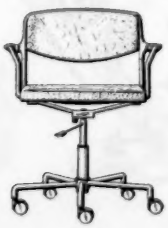
For CLASS	See PATENT NO.
D21–255	253,735

DESIGNS

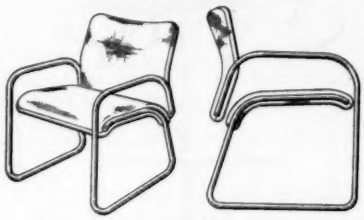
DECEMBER 18, 1979

253,676
BELT FOB
Robert G. Mathieson, 4457 Lakeshore Rd., Burlington, Ontario, Canada
Filed Feb. 27, 1978, Ser. No. 881,871
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400

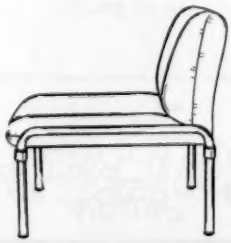
253,677
SWIVEL CHAIR
Karl Lübke, Rheda, Fed. Rep. of Germany, assignor to Lübke KG, Rheda, Fed. Rep. of Germany
Filed Sep. 9, 1977, Ser. No. 831,796
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



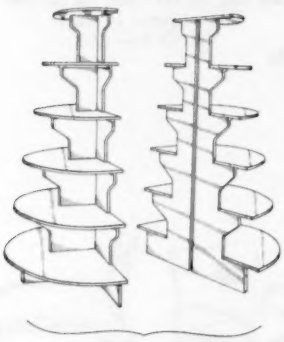
253,678
CHAIR
Charles A. Gibilterra, Granada Hills, Calif., assignor to Vecta Contract, Inc., Dallas, Tex.
Filed Aug. 24, 1977, Ser. No. 827,389
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



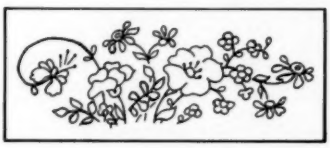
253,679
CHAIR
Karl Lübke, Rheda, Fed. Rep. of Germany, assignor to Lübke KG, Rheda, Fed. Rep. of Germany
Filed Sep. 9, 1977, Ser. No. 831,798
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



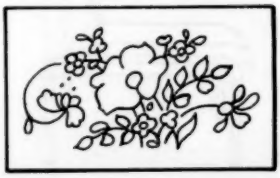
253,680
DISPLAY STAND
Ronald D. Jaros, 2765 Crocker Rd., and Ernest J. Leone, 996 Blackfoot, both of Eugene, Oreg. 97404
Filed Jan. 3, 1978, Ser. No. 866,761
Term of patent 14 years
Int. Cl. D6—*04;* D20—*02*
U.S. Cl. D6—146



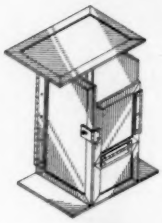
253,681
DECAL FOR CULINARY WARE OR THE LIKE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 21, 1977, Ser. No. 817,854
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—39



253,682
DECAL FOR CULINARY WARE OR THE LIKE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Jul. 21, 1977, Ser. No. 817,856
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—39

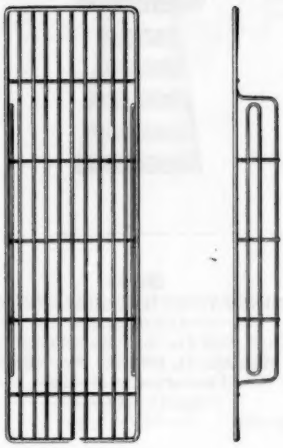


253,683
PORTABLE OUTDOOR COOKING AND BODY HEATER STOVE
Joseph D. Goetz, 1914 W. Tuscarawas, Canton, Ohio 44708
Filed Sep. 29, 1977, Ser. No. 837,755
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107



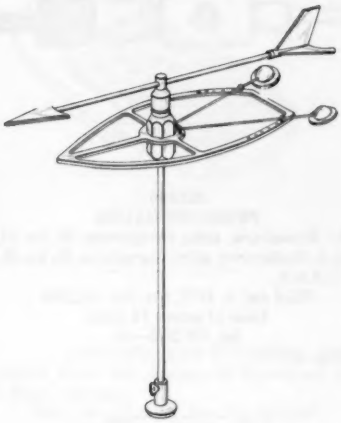
253,684
SOLAR STOVE
Merton L. Clevett, and Mildred L. Clevett, both of 4685 S. Ogden St., Englewood, Colo. 80110
Filed Jul. 5, 1977, Ser. No. 813,124
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109

253,685
OVER THE SINK RINSE BASKET
George Chapman, 1712 Park Blvd., Cherry Hill, N.J. 08002
Filed Dec. 12, 1977, Ser. No. 859,307
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—187

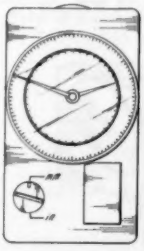


253,686
CONTROL KNOB
Darrel Wooldridge, Los Angeles, and Eugene T. McKinnon, Pacific Palisades, both of Calif., assignors to Gem Products, Inc.
Filed Oct. 25, 1977, Ser. No. 845,158
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—312

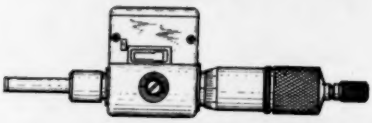
253,687
SAIL BOAT WIND INDICATOR
Ronald A. Fannon, Victor, and Ronald T. Kosmider, East Rochester, both of N.Y., assignors to Fannon Metal Industries, Inc., Rochester, N.Y.
Filed Oct. 13, 1977, Ser. No. 841,643
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—59



253,688
FRICTION WHEEL MEASURING DEVICE
Irven H. Culver, Playa Del Rey, and Oleg Szymber, Palos Verdes, both of Calif., assignors to Primus Mfg., Inc.
Filed Jan. 18, 1978, Ser. No. 870,341
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

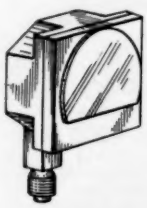


253,689
MICROMETER HEAD
Tetsunori Tanada, Kure, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed May 12, 1977, Ser. No. 796,270
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



253,690
PRESSURE GAUGE
Zigmund G. Bljumshtein, ulitsa Pavljukhina, 85, kv. 25, Kazan, and Oleg A. Kosheverov, ulitsa Kartashova, 68, kv. 25, Tomsk, both of U.S.S.R.
Filed Jul. 1, 1977, Ser. No. 812,394
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85

253,691
PRESSURE GAUGE
Zigmund G. Bljumshtein, ulitsa Pavljukhina 85, kv. 25; Lev A. Bychkin, ulitsa Universitetskaya, 5/37, kv. 14, and Nikolai S. Ivanshin, ulitsa Sotsialisticheskaya, 8/10, kv. 1, all of Kazan, U.S.S.R.
Filed Jul. 6, 1977, Ser. No. 813,344
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85

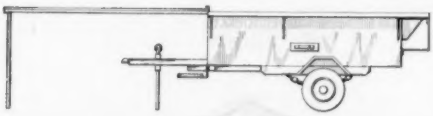


253,692
HIGHWAY MARKER
Gordon R. Lange, Bartlett, Ill., assignor to Lighthouse Industries, Inc., Bartlett, Ill.
Filed Mar. 20, 1978, Ser. No. 879,689
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109

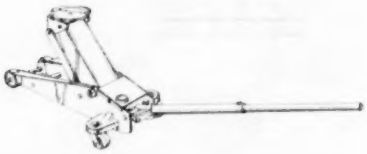
253,693
COMBINED TIMEPIECE DIAL AND HANDS THEREFOR
Sandra M. Guyll, 4400 91st St., NE., Bellevue, Wash. 98004
Filed Apr. 11, 1977, Ser. No. 786,501
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

253,694
PENDANT
Charles W. Ellis, 7250 E. Diamond, Scottsdale, Ariz. 85257
Filed Mar. 1, 1978, Ser. No. 882,960
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

253,695
MOBILE BROILER
James Simmons, P.O. Box 312, 5044 St. Joseph Ave., Stevensville, Mich. 49127
Filed Apr. 14, 1977, Ser. No. 787,581
Term of patent 14 years
Int. Cl. D7—*02;* D12—*13*
U.S. Cl. D12—22

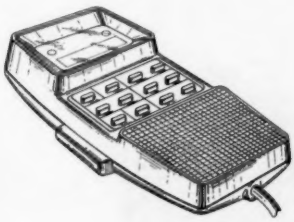


253,696
HYDRAULIC LIFTING JACK
Yasunori Suzuki, Fujinomiya, Japan, assignor to Yasui Sangyo Co. Ltd., Fujinomiya, Japan
Filed Jan. 5, 1978, Ser. No. 867,373
Claims priority, application Japan, Aug. 22, 1977, 52-32961
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55

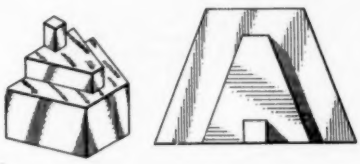


253,697
TOWING ROD
Henry K. Zephir, 28 Eastwood Dr., Wilbraham, Mass. 01095
Filed Jul. 19, 1977, Ser. No. 817,113
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—162

253,698
REMOTE CONTROL UNIT FOR RADIO OR SIMILAR ARTICLE
Stephen A. Nichols, Lincoln, Nebr., and David P. Chuboff, North Barrington, Ill., assignors to Hy-Gain de Puerto Rico, Inc.
Filed Aug. 8, 1977, Ser. No. 822,782
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



253,699
LOUDSPEAKER SYSTEM
Gary C. Gillum, Hope, Ark., assignor to Klipsch and Associates, Inc. of Hope, Arkansas
Filed Nov. 14, 1977, Ser. No. 851,538
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



253,700
MIDRANGE FREQUENCY LOUDSPEAKER
Gary C. Gillum, Hope, Ark., assignor to Klipsch and Associates, Inc., Hope, Ark.
Filed Nov. 14, 1977, Ser. No. 851,539
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—35

253,701

AUTOMATED TELLER TERMINAL

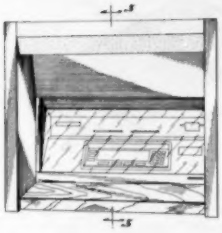
Thomas H. Woods, Middletown, Ohio, assignor to TRW, Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,404

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—42



253,702

AUTOMATIC DISKETTE LOADER

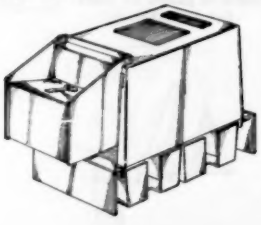
Amancio Alcala, Santa Ana, Calif., assignor to Three Phoenix Company, Phoenix, Ariz.

Filed Jun. 8, 1977, Ser. No. 804,723

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—46



253,703

HOUSING FOR TELEPHONE SET

Robert E. Hillmer, Carleton Place; Donald T. Chadwick, and John F. Tyson, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

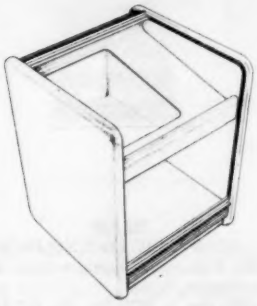
Filed Sep. 19, 1977, Ser. No. 834,700

Claims priority, application Canada, Jul. 20, 1977, 2007774

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—65



253,704

FLAPPER VALVE HOUSING FOR A CONCRETE PUMP OR THE LIKE

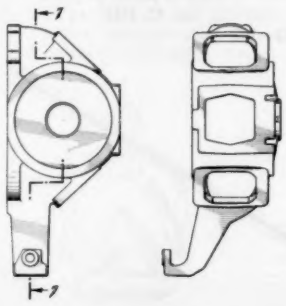
John T. McGraw, Laguna Beach, Calif., assignor to Thomsen Equipment Company, Gardena, Calif.

Filed May 20, 1977, Ser. No. 798,913

Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—7

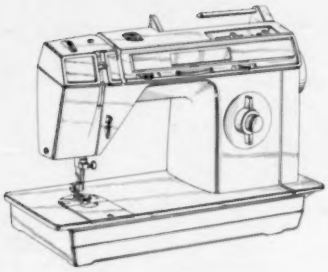


253,705

SEWING MACHINE

Christian J. Felix, Flushing, N.Y.; Donald M. Genaro, Haworth, and Stephen J. Illes, Scotch Plains, both of N.J., assignors to The Singer Company

Filed Apr. 4, 1977, Ser. No. 784,015
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69

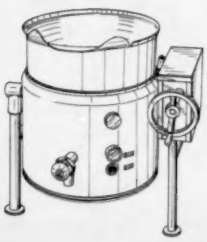


253,706

ELECTRIC SELF CONTAINED KETTLE

William M. Bardeau, 158 Norfinch Dr., Downsview, Ontario, Canada (M3N 1Y1)

Filed Jun. 13, 1977, Ser. No. 804,081
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—104

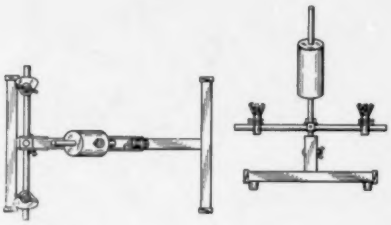


253,707

MACHINE FOR STRINGING RACQUETS

Donald A. Chartier, 88 Walnut St., Nashua, N.H. 03060, and Richard Janes, 4 E. Pine Isle Dr., Derry, N.H. 03038

Filed Feb. 1, 1978, Ser. No. 874,277
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

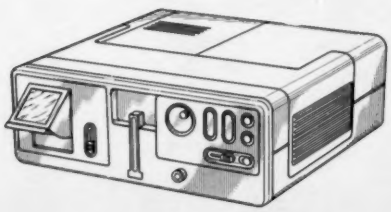


253,708

PHOTOGRAPHIC SLIDE PROJECTOR

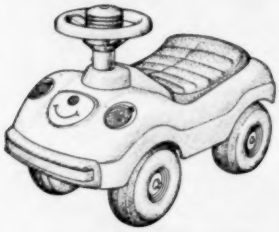
Dieter Mankau, Brunswick, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 738,837, Nov. 4, 1976, Pat. No. Des. 250,199. This application Oct. 14, 1977, Ser. No. 842,372
Claims priority, application Fed. Rep. of Germany, May 10, 1976, MR 1085; Apr. 20, 1977, MR 1125
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21

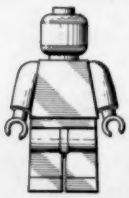


253,709
APPARATUS FOR INDICATING NUMERICAL CONCEPTS
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Oct. 14, 1977, Ser. No. 842,112
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

253,710
VEHICLE TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 725,914, Sep. 22, 1976. This application Mar. 13, 1978, Ser. No. 886,012
Claims priority, application Japan, Jun. 28, 1976, 51-24677
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—78



253,711
TOY FIGURE
Godtfred K. Christiansen, and Jens N. Knudsen, both of Billund, Denmark, assignors to Interlego AG, Baar, Switzerland
Filed Feb. 14, 1978, Ser. No. 877,800
Claims priority, application Denmark, Aug. 29, 1977, 650
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—166

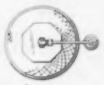


253,712
TENNIS POST
George R. Marolt, Englewood, and Norbert Vogler, Lakewood, both of Colo., assignors to E. J. Renner & Associates, a part interest
Filed Apr. 17, 1978, Ser. No. 897,527
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—199

253,713
TENNIS RACKET
Mark L. Robinson, Andover, and Paul E. Brefka, Southborough, both of Mass., assignors to Acro Incorporated, Stoneham, Mass.
Filed Jan. 5, 1978, Ser. No. 867,425
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

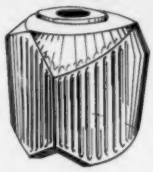
253,714
HOLSTER
Arthur E. Katz, 18A Hilltop Apts., Little Falls, N.J. 07424
Filed Oct. 6, 1977, Ser. No. 839,971
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

253,715
WATER FILTER
Philip L. Emery, P.O. Box 18590, Irvine, Calif. 92713
Filed Jul. 22, 1977, Ser. No. 818,021
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

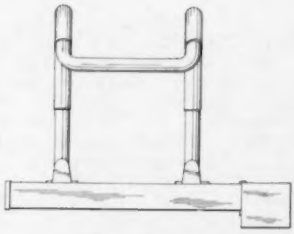


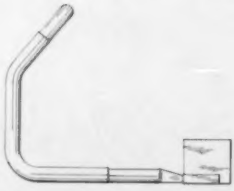
253,716
VALVE SPOOL
Russell W. Spitz, 6802 Tanglewood Dr., Boardman, Ohio 44512
Filed Aug. 8, 1977, Ser. No. 822,422
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19

253,717
FAUCET HANDLE
George H. Frost, Kent, Ohio, assignor to Sajar Plastics, Inc., Middlefield, Ohio
Filed Jan. 3, 1978, Ser. No. 866,755
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

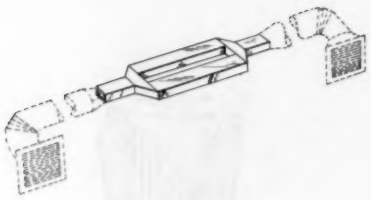


253,718
FIREPLACE HEATER
Donald A. Boyd, Euclid, and Allen W. Gale, Rocky River, both of Ohio, assignors to Cardinal American Corporation, Cleveland, Ohio
Filed Jan. 5, 1978, Ser. No. 867,422
Term of patent 14 years
Int. Cl. D23—*03;* D7—*08*
U.S. Cl. D23—95

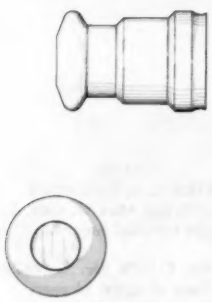




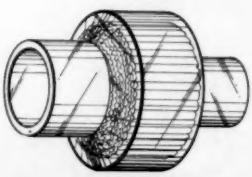
253,719
FIREPLACE HEAT EXCHANGE TUBING DEVICE
Ronald C. DiDonato, 6200 W. Ohio Ave., Lakewood, Colo. 80226
Filed Jul. 25, 1977, Ser. No. 818,822
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136



253,720
SYRINGE PLUNGER TIP
Marcus J. Millet, New York, N.Y., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Oct. 26, 1977, Ser. No. 845,750
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—25

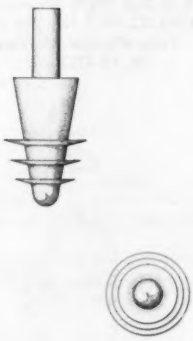


253,721
MOISTURE AND HEAT EXCHANGER FOR RESPIRATORY APPARATUS
Sten G. Gibeck, Upplands Vasby, Sweden, assignor to Louis Gibeck AB
Filed Jul. 25, 1977, Ser. No. 818,729
Claims priority, application Sweden, Jan. 28, 1977, 770203
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—52

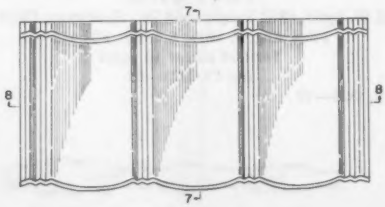


253,722
MEDICATION CARRIER
Donald G. Allen, Box 131, Dayton, Nev. 89403
Filed Aug. 2, 1977, Ser. No. 821,326
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

253,723
EAR PLUG
Howard S. Leight, 3945 Ridgemont Dr., Malibu, Calif. 90265
Filed Feb. 6, 1978, Ser. No. 875,609
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—67



253,724
METAL ROOFING TILE
Tomoo Yanoh, 3-1-7, Eifuku, Suginami-ku, Tokyo, Japan
Filed Mar. 7, 1978, Ser. No. 884,258
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92

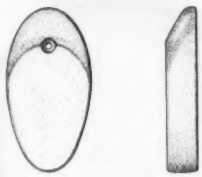


253,725

CIGARETTE HOLDER

Anneliese Martin, and Leslie A. Martin, both of 2611 W. Olive Ave., Ste. 13, Burbank, Calif. 91505

Filed Apr. 13, 1978, Ser. No. 895,939
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—07



253,726

RAZOR

April A. Schuman, 161 Palisade Ave., Cresskill, N.J. 07626; Wilfred G. Hoole, 10615 Stanwin Ave., Mission Hills, Calif. 91352, and Larry S. Harrison, 17640 Horace St., Granada Hills, Calif. 91344

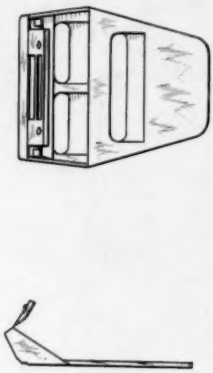
Filed Jul. 5, 1977, Ser. No. 812,527
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

253,727

DISPOSABLE RAZOR

Adolf Kowal, Tagarp 10, S-270 54 Tommarp, Sweden

Filed Nov. 16, 1977, Ser. No. 851,870
Claims priority, application Sweden, May 18, 1977, 771150
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

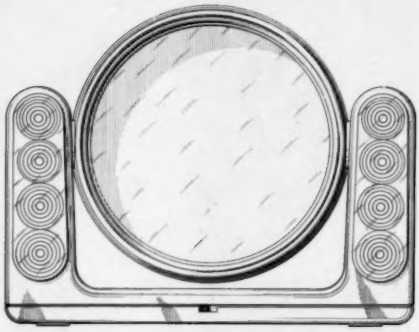


253,728

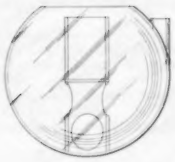
ELECTRIC MAKE-UP MIRROR OR SIMILAR ARTICLE

Walter C. Anderson, West Redding, Conn., assignor to General Electric Company

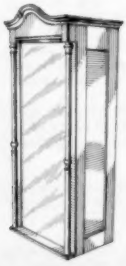
Filed Dec. 19, 1977, Ser. No. 861,660
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—67



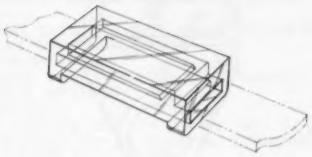
253,729
AQUARIUM OR SIMILAR ARTICLE
Nazareen Ward, 2038 85th Ave., Oakland, Calif. 94621
Continuation-in-part of Ser. No. 753,918, Dec. 23, 1976. This application Jun. 5, 1978, Ser. No. 912,934
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6



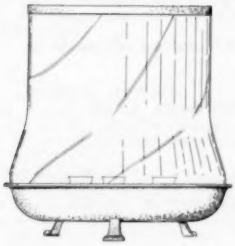
253,730
AQUARIUM
Michelle E. Browne, 6678 SW. 140th Ct., Miami, Fla. 33183
Filed Sep. 14, 1978, Ser. No. 942,400
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—9



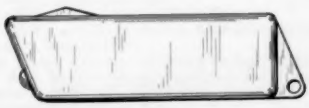
253,731
IDENTIFICATION TAG FOR AN ANIMAL COLLAR OR SIMILAR ARTICLE
Esther O. Mayfield, 5565 Thunderbird La., La Jolla, Calif. 92037
Filed Sep. 12, 1977, Ser. No. 832,840
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38



253,732
COMBINED CANDLEHOLDER AND CENTERPIECE OR THE LIKE
John Van Koert, 190 E. 72nd St., New York, N.Y. 11209
Filed Sep. 23, 1977, Ser. No. 835,989
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



253,733
POCKET FLASHLIGHT
Raymond W. Simmons, North Pinellas, Fla., assignor to Concept Inc., Clearwater, Fla.
Filed Nov. 23, 1977, Ser. No. 854,502
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

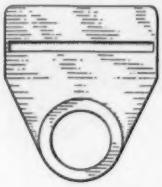


253,734

BECKET

John Howard, Scarborough, Canada, assignor to Reliance Products Ltd.

Filed Feb. 16, 1977, Ser. No. 769,167
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—255

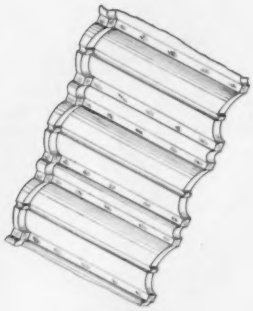


253,735

ROOFING TILE

Miles H. K. Furley, Grampian Rd., St. Heliers, Auckland, New Zealand

Filed Apr. 20, 1977, Ser. No. 789,111
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—29



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF DECEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aasland, Reuben E. Self-wringing mop. 4,178,650, Cl. 15-120.00R.

AB Bofors: *See*—
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., 4,178,831, Cl. 89-41.00H.

Abbott Coin Counter Company, Inc.: *See*—
O'Maley, James B., 4,179,685, Cl. 340-146.30H.

Abbott, Horace P., to Lever Brothers Company. Container cap. 4,179,052, Cl. 222-509.000.

Abbott, Liston, to RCA Corporation. System for transmitting two color TV signals. 4,179,703, Cl. 358-11.000.

Abdoo, Alfred H. Chemical metering apparatus. 4,179,047, Cl. 222-133.000.

Aboussouan, Michael F.: *See*—
Cone, Bryan N.; and Aboussouan, Michael F., 4,179,125, Cl. 273-162.00B.

Abrasives International Limited: *See*—
Ashworth, Stuart I., 4,179,238, Cl. 415-197.000.

ACF Industries, Incorporated: *See*—
Kemp, Willard E.; and Morrison, Bert L., 4,178,665, Cl. 29-157.10R.
Klimazewski, Leo T.; and McNairy, James A., 4,178,755, Cl. 60-290.000.
Laitkep, Anthony A.; Meyer, Danny S.; and Saka, Hamid J., 4,179,098, Cl. 251-167.000.
White, Jack M., 4,178,953, Cl. 137-116.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed: *See*—
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,179,275, Cl. 65-20.000.

Acme Highway Products Corporation: *See*—
Puccio, Guy S., 4,179,226, Cl. 404-64.000.

Adachi, Akio, to Hockiki Corporation. Memory apparatus for disaster preventing system. 4,179,751, Cl. 365-228.000.

Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vacuum union for an internal combustion engine. 4,178,756, Cl. 60-397.000.

Adachi, Keiichi: *See*—
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, 4,179,293, Cl. 430-551.000.

Adams, Kenneth D., to Singer Company, The. Adjustable bobbin thread run-out indicator. 4,178,866, Cl. 112-278.000.

Adams, Leo; and Kooi, Edward, to Arvey Corporation. Apparatus for cleaning roller surfaces. 4,178,652, Cl. 15-302.000.

Adwest Engineering Limited: *See*—
Millard, Barry J., 4,178,835, Cl. 91-375.00A.

Aftergut, Siegfried: *See*—
Cole, Herbert S., Jr.; and Aftergut, Siegfried, 4,179,395, Cl. 252-299.000.

Agergards Maskiner AB: *See*—
Asplund, Alf A., 4,179,225, Cl. 403-322.000.

AGFA-Gevaert, A.G.: *See*—
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.
Johanns, Heinz, 4,179,079, Cl. 242-56.00R.
Stemme, Otto; Lermann, Peter; Engelsmann, Dieter; and Went, Werner, 4,179,028, Cl. 206-316.000.
Vetter, Hans; and Marx, Paul, 4,179,291, Cl. 430-223.000.

Agulnek, Martin A., to Xerox Corporation. Crossover arrangement for multiple scanning arrays. 4,179,620, Cl. 250-566.000.

Agulnek, Martin A.: *See*—
Crean, Peter A.; Lavallee, Pierre A.; and Agulnek, Martin A., 4,179,621, Cl. 250-566.000.

Ahlen, Karl G., to S.R.M. Hydromekanik Aktiebolag. Two-speed gear transmission. 4,178,814, Cl. 74-781.00R.

Aide, Richard J. Floatation pump device. 4,179,243, Cl. 417-61.000.

Aihara, Sukeji: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Aihara, Takayuki: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.

Aine, Harry E. Method for making a swimming pool cover template. 4,178,690, Cl. 33-174.00G.

Aizawa, Hiroshi: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.

Aizawa, Tatsuo: *See*—
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.

Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, to Nippondenso Co., Ltd. Thermostatic valve for intake air temperature compensation for internal combustion engine. 4,178,898, Cl. 123-122.00D.

Akai, Chiaki: *See*—
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.

Akiba, Shigeyuki: *See*—
Sakai, Kazuo; Akiba, Shigeyuki; and Yamamoto, Takaya, 4,179,317, Cl. 148-171.000.

Akishino, Katsuo: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Akiyama, Toru: *See*—
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, 4,179,628, Cl. 307-279.000.

Albert Rolland, S.A.: *See*—
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, 4,179,516, Cl. 424-278.000.

Albright & Wilson Limited: *See*—
Jones, Trevor E., 4,179,458, Cl. 260-429.700.

Albu, Margareta: *See*—
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.

Alcan Research and Development Limited: *See*—
Zwicker, James D.; and Dube, Ghyslain, 4,178,796, Cl. 73-61.400.

Alder, Christopher J., to Plessey Handel und Investments AG. Frequency control systems. 4,179,694, Cl. 343-5.0AF.

Alderman, William; and Hodgson, Eric C., to David Brown Tractors Limited. Final drive gearing with brake. 4,179,016, Cl. 192-4.00A.

Alessio, Attilio; Parpaiola, Carlo; and Antonio, Pier. Electric resistance welding machine. 4,179,598, Cl. 219-79.000.

Alf, Herbert; and Bussinger, Fritz, to Filterwerk Mann & Hummel GmbH. Filter dust ejector and check valve arrangement in exhaust system of internal combustion engine. 4,178,760, Cl. 60-319.000.

Alfa Farmaceutici, S.p.A.: *See*—
Marchi, Egidio; and Montecchi, Lauretta, 4,179,438, Cl. 260-239.30P.

Alfa Romeo S.p.A.: *See*—
Pasini, Luciano, 4,179,036, Cl. 220-22.000.

Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, to Tenneco Chemicals, Inc. Process for the production of overbased manganese salts of organic acids. 4,179,385, Cl. 252-33.000.

Allegheny Ludlum Industries, Inc.: *See*—
Miller, Clarence L., Jr., 4,179,315, Cl. 148-113.000.

Allely, Robert; and Bailey, Alfred J., to Massey-Ferguson Services N.V. Agricultural mowers. 4,178,744, Cl. 56-16.200.

Allely, Robert, to Massey-Ferguson Services N.V. Rotary mowers. 4,178,746, Cl. 56-53.000.

Allen-Bradley Company: *See*—
Selas, George J., 4,179,676, Cl. 335-59.000.

Allied Chemical Corporation: *See*—
Seldner, Alvin A., 4,179,327, Cl. 156-667.000.

Allied Piping Products Company, Inc.: *See*—
Newman, John W., 4,179,141, Cl. 285-189.000.

Allingham, Yael; Vofsi, David; and Gassner, Saul A., to Yeda Research and Development Co. Ltd. Polyethylene sheets and films. 4,179,547, Cl. 525-2.000.

Allis-Chalmers Corporation: *See*—
Flavel, Malcolm D., 4,179,074, Cl. 241-24.000.
Hanaway, Roger D., 4,178,944, Cl. 130-27.00R.
Rockwell, Randal L., 4,178,998, Cl. 172-311.000.

Almen, Karl-Gosta, to Consul S. A. Absorption refrigeration apparatus. 4,178,774, Cl. 62-493.000.

Alonso, Sydney A. Musical synthesis envelope control techniques. 4,178,822, Cl. 84-1.010.

Altman, Daniel E.: *See*—
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., 4,179,194, Cl. 350-356.000.

Aluminum Company of America: *See*—
Das, Subodh K., 4,179,345, Cl. 204-67.000.
Das, Subodh K.; and Boget, Paul J., 4,179,346, Cl. 204-67.000.

Alvarez Domingo, Mercedes: *See*—
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

American Antenna Corporation: *See*—
Liautaud, James P., 4,179,698, Cl. 343-715.000.

American Can Company: *See*—
Meyers, George L., 4,179,060, Cl. 229-8.000.

Rohowetz, Stanley E.; and Schoenfisch, Eric, 4,179,397, Cl. 252-408.000.

American Cyanamid Company: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., 4,179,451, Cl. 260-395.000.

American Home Products Corp.: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.

American Hospital Supply Corporation: *See—*
Cawood, Charles D., Jr.; and Ziegler, John S., 4,178,920, Cl. 128-4.000.

American Microsystems, Inc.: *See—*
Gregorian, Roubik, 4,179,665, Cl. 330-107.000.

American Optical Corporation: *See—*
Chang, Leei, 4,179,181, Cl. 350-1.700.
Persson, Staffan B.; and Tackaberry, Robert B., 4,179,196, Cl. 351-30.000.

American Shower Door Co., Inc.: *See—*
Laby, Jordan M., 4,178,718, Cl. 49-411.000.

Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, to Sodip S.A. Hollow fibre apparatus. 4,179,380, Cl. 210-321.00A.

Amico, Peter J.: *See—*
Amico, Raymond F.; and Amico, Peter J., 4,178,672, Cl. 29-430.000.

Amico, Raymond F.; and Amico, Peter J. Apparatus for assembling and banding an expansion shell. 4,178,672, Cl. 29-430.000.

Ammeral Nederland B.V.: *See—*
de Vries, Jacobus, 4,179,026, Cl. 198-834.000.

AMP Incorporated: *See—*
Collier, John C.; and Owen, Leonard J., 4,178,973, Cl. 140-123.600.
Phillips, Howard C., 4,178,675, Cl. 29-566.100.

Amprint Corp.: *See—*
Harris, Jerome R., 4,179,107, Cl. 270-4.000.
Harris, Jerome R., 4,179,109, Cl. 270-52.000.

Anderson Bros. Mfg. Co.: *See—*
Stohlquist, Roger H., 4,178,737, Cl. 53-550.000.

Anderson, Roy E.: *See—*
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.

Anderson, Vaughn R.; Woolley, Ronald L.; and Davis, Edward H., to Billings Energy Corporation. Hydrogen fuel supply system. 4,178,882, Cl. 123-1.00A.

Ando, Eiji: *See—*
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.

Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of assembling a valve device for an exhaust gas recirculation system of an internal combustion engine. 4,178,666, Cl. 29-156.70R.

Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Stable aqueous suspension of water-insoluble, calcium-binding aluminosilicates and organic suspending agents. 4,179,393, Cl. 252-155.000.

Angioletti, Attilio, to Industrie Pirelli S.p.A. Process for manufacturing reinforced elastomeric hoses and resultant product. 4,178,968, Cl. 138-126.000.

ANIC S.p.A.: *See—*
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, 4,179,459, Cl. 260-448.00R.

Anonima Castelli S.p.A.: *See—*
Ponzellini, Giulio, 4,178,858, Cl. 108-150.000.

Antonio, Pier: *See—*
Alessio, Attilio; Parpaiola, Carlo; and Antonio, Pier, 4,179,598, Cl. 219-79.000.

Antonov, Boris M.; Vasiliev, Viktor V.; and Pischikov, Sergei I., to Institut vysokikh temperatur Akademii Nauk SSSR. Self-optimizing control system for object with unimodal quality function. 4,179,730, Cl. 364-105.000.

Antos, George J., to UOP Inc. Acidic sulfur-free multimetallic catalytic composite. 4,179,405, Cl. 252-441.000.

Antos, George J., to UOP Inc. Acidic multimetallic catalytic composite. 4,179,406, Cl. 252-442.000.

Antos, George J.: *See—*
Flagg, John F.; and Antos, George J., 4,179,360, Cl. 208-139.000.

Aoki, Eiichiro; and Yamada, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,178,824, Cl. 84-1.190.

Aoki, Eiichiro: *See—*
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.

Aoki, Keiji, to Toyota Jidoshi Kogyo Kabushiki Kaisha. Ignition control apparatus for an internal combustion engine. 4,178,893, Cl. 123-117.00D.

Aoyagi, Takaaki: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.

Architectural Research Corporation: *See—*
Prusinski, Richard C.; and Johnson, Timothy E., 4,178,727, Cl. 52-173.00R.

Armco Inc.: *See—*
Tanczyn, Harry, 4,179,285, Cl. 75-126.00E.

Aron, Daniel L., to Mole-Richardson Co. Barn door lamp attachment. 4,179,726, Cl. 362-17.000.

Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., to Western Electric Co., Inc. Methods of and apparatus for conveying, orienting, testing and sorting articles. 4,179,032, Cl. 209-538.000.

Arvey Corporation: *See—*
Adams, Leo; and Kooi, Edward, 4,178,652, Cl. 15-302.000.

Arvin Industries, Inc.: *See—*
Maxey, Alexander R., 4,179,717, Cl. 360-84.000.

Asada, Akihiro: *See—*
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, 4,179,650, Cl. 323-1.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Miyake, Tetsuya; Noguchi, Kohji; and Imamura, Kazuo, 4,179,576, Cl. 546-251.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, 4,179,201, Cl. 354-41.000.

Ashida, Akira: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.

Ashland Oil, Inc.: *See—*
Gardikes, John J., 4,179,427, Cl. 260-29.2TN.

Ashworth, Denis H., to Simon Engineering Dudley Limited. Access equipment. 4,179,010, Cl. 182-2.000.

Ashworth, Stuart I., to Abrasives International Limited. Centrifugal pumps. 4,179,238, Cl. 415-197.000.

Asplund, Alf A., to Agergards Maskiner AB. Quickly detachable coupling. 4,179,225, Cl. 403-322.000.

Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, to American Home Products Corp. 1-Hydroxyalkanamine pyrano[3,4-b]indole derivatives. 4,179,503, Cl. 424-248.510.

Astill, Cyril J., to Atomic Energy of Canada Limited. Sealed torque transmission assembly. 4,178,815, Cl. 74-805.000.

Ateliers de la Motobecane S.A.: *See—*
Jaulmes, Eric, 4,178,888, Cl. 123-73.00V.

Athanas, Terry G., to Mostek Corporation. Method of stabilizing semiconductor device by converting doped poly-Si to polyoxides. 4,179,311, Cl. 148-1.500.

Atkinson, Wallace E. Removable trainer handle and brake for skateboard. 4,179,134, Cl. 280-87.04A.

Atlas Powder Company: *See—*
Smith, Don H.; and Barton, Leslie W., 4,178,852, Cl. 102-24.00R.

Atomic Energy of Canada Limited: *See—*
Astill, Cyril J., 4,178,815, Cl. 74-805.000.

Attenburrow, Derek C.: *See—*
Harper, Douglas C.; and Attenburrow, Derek C., 4,178,716, Cl. 147-62.000.

Au, Anthony S. Pressure control systems. 4,178,938, Cl. 128-207.150.

Au, Anthony S. Pressure control systems. 4,178,940, Cl. 128-207.150.

Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, to Boehringer Ingelheim GmbH. Sulfur-containing derivatives of 4,4-dimethyl-2H,4H-isoquinoline-1,3-dione, and anticonvulsant and antihyperlipidemic compositions thereof. 4,179,508, Cl. 424-258.000.

Australia Paper Manufacturers Limited: *See—*
Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, 4,178,861, Cl. 162-72.000.

Auto Research Corporation: *See—*
Napolitano, Joseph J.; and Richardson, Michael, 4,178,960, Cl. 137-494.000.

Automatic Liquid Packaging, Inc.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,178,976, Cl. 150-0.500.

Automatic Switch Company: *See—*
Fromfield, James P., 4,179,096, Cl. 251-38.000.
Riefler, Roger G.; and Rolfe, Alfred, 4,178,963, Cl. 137-624.180.

Avery International Corporation: *See—*
Nemeth, Suzette B., 4,178,933, Cl. 128-284.000.

Avon Products, Inc.: *See—*
Umstead, Herbert R., 4,179,049, Cl. 222-631.000.

Avtex Fibers Inc.: *See—*
Smith, Frederick R., 4,179,416, Cl. 260-17.4CL.

Babbitless: *See—*
Barrot, Jean C.; and Pulido, Philippe, 4,179,076, Cl. 241-216.000.

Bacher, Michel, to Societe Anonyme Francaise du Ferodo. Sheave for a speed variator and a method of replacing a belt thereon. 4,178,808, Cl. 74-230.17E.

Bachman, William J.; and Dimeo, Franklin R., to RCA Corporation. Plug-in circuit cartridge with electrostatic charge protection. 4,179,178, Cl. 339-111.000.

Badmin, John S.: *See—*
Felton, John C.; Badmin, John S.; and Twydell, Roland S., 4,179,518, Cl. 424-300.000.

Baier, Ludwig S. Railway track hold-down hardware. 4,179,067, Cl. 238-91.000.

Bailey, Alfred J.: *See—*
Allely, Robert; and Bailey, Alfred J., 4,178,744, Cl. 56-16.200.

Bailly, Emile, to Compagnie International pour l'Informatique Cii-Honeywell Bull. Mechanism for locking a plate which is movable on a table along guide means. 4,179,014, Cl. 188-43.000.

Baker, Brian G. Carton blanks and cartons made therefrom. 4,179,062, Cl. 229-37.00R.

Baker, Gerry L.: *See*—
Baker, William J.; and Baker, Gerry L., 4,178,952, Cl. 137-38.000.
Baker, William J.; and Baker, Gerry L. Inertial valve. 4,178,952, Cl. 137-38.000.
Baldus, Wolfgang; and Lehmer, Wilhelm, to Linde Aktiengesellschaft. Intermittent vibration in fractional crystallization. 4,178,776, Cl. 62-538.000.
Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 4-Substituted-2-arylimidazoles. 4,179,512, Cl. 424-273.00R.
Ballweber, Edward G.: *See*—
Phillips, Kenneth G.; Ballweber, Edward G.; and Hurlock, John R., 4,179,424, Cl. 260-29.4UA.
Bankstahl, Herbert A., to Brunswick Corporation. Exhaust coupling assembly for a marine stern drive. 4,178,873, Cl. 115-73.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, to Pfizer Inc. L- and DL-Phenylglycines to treat a disease of condition attributable to reduced blood flow. 4,179,520, Cl. 424-309.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, to Pfizer Inc. L- and DL-Phenylglycines to treat diseases or conditions attributable to reduced carbohydrate metabolism. 4,179,521, Cl. 424-309.000.
Barone, Bruno J., to Denka Chemical Corporation. Catalyst preparative method. 4,179,404, Cl. 252-435.000.
Barra, Frank J.; and Schleier, Richard L., to Smith Industries, Inc. Method and apparatus for injecting stripping gas into the reboiler section of a glycol reboiler. 4,179,328, Cl. 159-16.00R.
Barrot, Jean C.; and Pulido, Philippe, to Babbitless. Sealing device between the movable crushing member and the body of a giratory crusher. 4,179,076, Cl. 241-216.000.
Barstow, Glidden J.: *See*—
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., 4,179,194, Cl. 350-356.000.
Barth, Wayne E., to Pfizer Inc. Antibacterial 3-(5-tetrazolyl) penam compounds. 4,179,511, Cl. 424-271.000.
Barthell, Eduard; and Schmid, Otto, to Chemische Fabrik. Thickening urinary and intestinal tract excrement. 4,179,367, Cl. 210-41.000.
Barthell, Eduard: *See*—
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, 4,179,370, Cl. 210-51.000.
Bartholet, Stephen J., to Odetics, Inc. Continuous thru-wire welding machine. 4,179,597, Cl. 219-56.100.
Bartok nee Berencsy, Piroska: *See*—
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,467, Cl. 260-563.00R.
Bartok, Piroska, nee Berencsy: *See*—
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
Bartold, Mitchell E.: *See*—
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.
Barton, Leslie W.: *See*—
Smith, Don H.; and Barton, Leslie W., 4,178,852, Cl. 102-24.00R.
Bartschi, Jean-Jacques, to Hasler AG. Device for electromechanically positioning a unilaterally pivoted lever arm in three different stable positions. 4,179,701, Cl. 346-62.000.
BASF Aktiengesellschaft: *See*—
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,179,465, Cl. 260-544.00C.
BASF Wyandotte Corporation: *See*—
Newkirk, David D.; Thir, Basil; and Login, Robert B., 4,179,544, Cl. 428-395.000.
Bass, Douglas D.: *See*—
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.
Bata-Schuh-Aktiengesellschaft: *See*—
Mayer, Hubert J. M., 4,178,702, Cl. 36-59.00R.
Bateman, Robert F.; and Croyle, Jack V., to Dart Industries Inc. Storage and serving container or the like. 4,179,040, Cl. 220-410.000.
Battelle Memorial Institute: *See*—
Kalbskopf, Reinhard; and Trojer, Felix, 4,179,535, Cl. 427-206.000.
Bauer, Charles R.: *See*—
Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., 4,179,032, Cl. 209-538.000.
Baumann, Marvin J.: *See*—
Shoemaker, Edwin J.; Pacitti, William; and Baumann, Marvin J., 4,179,157, Cl. 297-83.000.
Baur, Rolf, to Schenk-Filterbau Gesellschaft mit beschrankter Haftung. Intake distributor for a settling tank filter. 4,179,381, Cl. 210-456.000.
Baxter, Samuel H. Cast protector. 4,178,924, Cl. 128-82.000.
Baxter Travenol Laboratories, Inc.: *See*—
Bratten, William R.; and Helfer, Joel N., 4,179,364, Cl. 210-321.00B.
Bayer Aktiengesellschaft: *See*—
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.
Marhold, Albrecht; and Klauke, Erich, 4,179,461, Cl. 260-465.00H.
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, 4,179,478, Cl. 525-113.000.
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.
Bayer, Eckhard: *See*—
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.
BBC Brown Boveri & Company Limited: *See*—
Vitins, Michael, 4,179,651, Cl. 324-51.000.
Wehrmuller, Beat; and Wienenga, Paul, 4,179,645, Cl. 318-139.000.
Becht, Carl T.; and Hueil, J. Charles, to Senco Products, Inc. Disposable surgical stapling instrument. 4,179,057, Cl. 227-19.000.
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. 4,5-Dichloroimidazole-2-carboxylic acid derivatives. 4,179,277, Cl. 71-92.000.
Becker, William M. Telephone cover. 4,179,591, Cl. 179-179.000.
Beckmann, Georg; and Trotzmuller, Alfred, to Waagner-Biro A.G. Method and apparatus for mixing two gas currents. 4,178,696, Cl. 34-13.000.
Bedard, Eugene J.: *See*—
Sablich, Milan; and Bedard, Eugene J., 4,179,373, Cl. 210-98.000.
Bedwell, Michael O., to Ortec Incorporated. Constant fraction signal shaping apparatus. 4,179,664, Cl. 328-150.000.
Beecham Group Limited: *See*—
Box, Stephen J.; and Hood, John D., 4,179,498, Cl. 424-117.000.
Ponsford, Roger J., 4,179,562, Cl. 544-298.000.
Beermann, Heinrich, to Kraftwerk Union Aktiengesellschaft. Device for bracing a stator winding disposed in the air gap of a synchronous generator. 4,179,635, Cl. 310-214.000.
Beggs, Donald; and Meissner, David C., to Midrex Corporation. Method for reducing particulate iron oxide to molten iron with solid reductant. 4,179,278, Cl. 75-11.000.
Begley, Paul M.: *See*—
Laganis, Deno; and Begley, Paul M., 4,179,423, Cl. 260-29.20N.
Behle, Fritz: *See*—
Heusler, Helmut; and Behle, Fritz, 4,179,020, Cl. 198-326.000.
Behmel, Klaus: *See*—
Zuckert, Bertram; Schmut, Wolfgang; and Behmel, Klaus, 4,179,428, Cl. 260-29.40R.
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F. Spinneret for the production of wool-like man-made filament. 4,179,259, Cl. 425-461.000.
Bell, David V.: *See*—
Zeigler, Jon G.; Kerr, Elmer L.; and Bell, David V., 4,179,603, Cl. 219-538.000.
Bell & Howell Company: *See*—
Workman, Dennis L., 4,179,709, Cl. 358-133.000.
Bell, Michael G.: *See*—
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.
Bell Telephone Laboratories, Incorporated: *See*—
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,179,322, Cl. 156-192.000.
Carrillo, Leo; and Madden, Thomas C., 4,178,678, Cl. 29-625.000.
Carter, Aaron B., 4,179,625, Cl. 307-234.000.
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.
Kaminow, Ivan P.; and Ramaswamy, Vellayan, 4,179,189, Cl. 350-96.330.
Rise, Samuel F., III, 4,179,173, Cl. 339-19.000.
Tynes, Arthur R., 4,179,186, Cl. 350-96.210.
Bemmels, Cyrus W., to Johnson & Johnson. Pressure sensitive adhesive and process. 4,179,415, Cl. 260-4.00R.
Bengt Petersson New Products Investment AB: *See*—
Petersson, Bengt O., 4,178,731, Cl. 52-520.000.
Benjamin, Benjamin C., to Schmelzer Corporation. Two stage vacuum break assembly. 4,178,895, Cl. 123-119.00F.
Benson, Carl F.: *See*—
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.
Bentz, Gerard; and Racouchot, Bernard, to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude. Means for injecting gas into a molten metal. 4,179,103, Cl. 266-225.000.
Bentz, Gerard: *See*—
Gilbert, Ghislain; Galey, Jean; and Bentz, Gerard, 4,178,980, Cl. 164-66.000.
Berg, Alexander: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.
Berg, Markus: *See*—
Kaufmann, Jochen; Berg, Markus; and Krings, Peter, 4,179,391, Cl. 252-99.000.
Berger, Leo; and Scott, John W., to Hoffmann-La Roche Inc. 6-Chloro-1,2,3,4-tetrahydrocarbazole-2-one. 4,179,443, Cl. 260-315.000.
Bergman, Raymond A. Apparatus for locating and clamping a work member supporting fixture. 4,179,106, Cl. 269-20.000.
Bergwerksverband GmbH: *See*—
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. Novel 2-substituted-3,4-epoxycyclopentan-1-ones, 2-substituted-3,4-epoxycyclopentan-1-ols, and various 2-substituted-cyclo-pentenones. 4,179,574, Cl. 562-503.000.

Bernardin, Frederick E., Jr.: *See—*
Coviello, Allan J.; Bernardin, Frederick E., Jr.; and Rohrkemper, Robert R., 4,179,616, Cl. 250-527.000.

Bernat, Jean-Pierre, to Societe Nationale Elf Aquitaine (Production). Removal of cyanide from waste water. 4,179,348, Cl. 204-151.000.

Berns, Michael S.; and Chafe, William J. Roadside emergency signalling device. 4,178,874, Cl. 116-28.00R.

Bernstein, Jack: *See—*
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold R., 4,179,564, Cl. 546-64.000.

Berry, Robert W., Jr.: *See—*
Still, Norman H.; and Berry, Robert W., Jr., 4,179,001, Cl. 175-57.000.

Bessin, Pierre: *See—*
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, 4,179,516, Cl. 424-278.000.

Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, to AGFA-Gevaert, A.G. Apparatus for developing latent electrostatic images. 4,179,210, Cl. 355-10.000.

Bettcher Industries, Inc.: *See—*
Bettcher, Louis A., 4,178,683, Cl. 30-276.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Knife with removable blade. 4,178,683, Cl. 30-276.000.

Beuther, Harold; and Swift, Harold E., to Gulf Research and Development Company. Process for conversion of naphtha to ethylene. 4,179,474, Cl. 585-251.000.

Bianchi, Nereo; and Zatti, Piergentino, to Necchi, S.p.A. Programmed sewing machine with two connectable and disconnectable needle bars. 4,178,862, Cl. 112-121.110.

Bianchi, Valerio: *See—*
Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, 4,178,891, Cl. 123-117.00R.

Bidney, Roger. Vertically adjustable drapery rod support. 4,179,091, Cl. 248-265.000.

Bien, Daniel, heir: *See—*
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bien, Else, Gabriele Bien, Dorothee Bien, legal representatives: *See—*
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bien, Hans-Samuel, deceased: *See—*
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bien, Petra, heir: *See—*
Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased; Bien, Petra, heir; and Bien, Daniel, heir, 4,179,450, Cl. 260-377.000.

Bieri, Hans, to Sulzer Brothers Ltd. Heat exchanger and a heat exchanger element therefor. 4,178,991, Cl. 165-166.000.

Bigot, Lucien: *See—*
Kemper, Yves J.; and Bigot, Lucien, 4,178,812, Cl. 74-745.000.

Bikbau, Marsel Y.: *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.

Billings Energy Corporation: *See—*
Anderson, Vaughn R.; Woolley, Ronald L.; and Davis, Edward H., 4,178,882, Cl. 123-1.00A.

Binstock, Morton H.; and Johnson, Steven J., to Westinghouse Electric Corp. Efficient valve position controller for use in a steam turbine power plant. 4,178,762, Cl. 60-667.000.

Biomechanics Limited: *See—*
Rippon, George M., 4,179,220, Cl. 366-102.000.

Biot, Bernard: *See—*
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

Birat, Jean-Pierre; and Ventavoli, Roger, to Institut de Recherches de la Siderurgie Francaise. Method of and apparatus for electromagnetic mixing of metal during continuous casting. 4,178,979, Cl. 164-49.000.

Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, to Hoechst Aktiengesellschaft. Process for the reduction of the frosting effect in dyeing of textile fabrics. 4,178,705, Cl. 38-144.000.

Birkner, Udo, to Blaupunkt-Werke GmbH. Mounting arrangement for a loudspeaker to a resonance panel permitting front insertion assembly. 4,179,009, Cl. 181-171.000.

Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. 2-Chloroethyl phosphonate compositions. 4,179,482, Cl. 260-941.000.

Birum, Gail H.; and Jansen, Richard F., to Monsanto Company. 2-Chloroethyl phosphonates. 4,179,483, Cl. 260-941.000.

Bischoff, Martin: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Bitzer, David R., to United States of America, Army. Secret-signalling system utilizing noise communication. 4,179,658, Cl. 325-34.000.

Bjork, Lennart W., to Litton Systems, Inc. Method for processing fiberoptic electronic components of electronic vacuum devices. 4,179,596, Cl. 219-10.55M.

Blaupunkt-Werke GmbH: *See—*
Birkner, Udo, 4,179,009, Cl. 181-171.000.

Block Drug Company, Inc.: *See—*
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.

Bochumer Eisenhutte Heintzmann GmbH & Co.: *See—*
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-27.000.

Bockstie, Lawrence G., Jr., to Corning Glass Works. Fast curing coating composition. 4,179,477, Cl. 525-284.000.

Boeckx, Gustaaf M.: *See—*
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.

Boehringer Ingelheim GmbH: *See—*
Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, 4,179,508, Cl. 424-258.000.

Boeing Company, The: *See—*
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., 4,179,218, Cl. 356-336.000.
Gillette, Roger B.; and Woods, Weightstill W., 4,179,193, Cl. 350-295.000.
Hirsch, Irving A., 4,178,871, Cl. 114-275.000.
Lunden, Clarence D., 4,179,699, Cl. 343-872.000.

Boersma, Richard F., to Fiat-Allis Construction Machinery, Inc. Scraper elevator drive mounting. 4,179,024, Cl. 198-806.000.

Bogdanovic, George, to Jet Press, Inc. Rail strip and locking device. 4,179,138, Cl. 281-15.00B.

Boget, Paul J.: *See—*
Das, Subodh K.; and Boget, Paul J., 4,179,346, Cl. 204-67.000.

Boismard, Pierre M.: *See—*
Brachet, Roland F. C.; and Boismard, Pierre M., 4,179,198, Cl. 352-100.000.

Bokros, Jack C., to Carbomedics, Inc. Two-leaflet heart valve. 4,178,639, Cl. 3-1.500.

Bollinger, Frederic G.; and D'Amico, John J., to Monsanto Company. Phthalic dianilides. 4,179,466, Cl. 260-558.00A.

Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,178,997, Cl. 172-112.000.

Bonhomme, Francois R. Cabinets for electrical or electronic equipment. 4,179,724, Cl. 361-391.000.

Bonicalzi, Maria P.; and De Gasperi, Mario M. System for checking the authenticity of identification papers. 4,179,686, Cl. 340-146.3AG.

Bonney, Maurice C. Point-of-aim indicator. 4,178,694, Cl. 33-289.000.

Borik, Alexandr G.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.

Borisenko, Alexandr V.: *See—*
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.

Borodin, Daniel J., to U.S. Automation Company. Spark plug conveyor and assembling means. 4,178,662, Cl. 29-25.200.

Borre, Earl A., to Industrial Filter & Pump Mfg. Co.; and Industrial Filter & Pump Mfg. Co. Filter leaf. 4,179,378, Cl. 210-232.000.

Bosch Cartes, Juan: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

Bose Corporation: *See—*
Dodson, George B.; and Nangeroni, John A., 4,179,669, Cl. 330-282.000.

Bossert, Friedrich: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Boswick, John A., Jr.: *See—*
Buechler, Ulrich H.; Phelps, Dennis B.; and Boswick, John A., Jr., 4,178,640, Cl. 3-1.910.

Bottcher, Peter. Circuit arrangement for adjusting the volume of an automobile radio receiver in dependence on road noise. 4,179,667, Cl. 330-149.000.

Bottega Incisioni di Orizio-Giovanelli: *See—*
Giovanelli, Cesare, 4,178,846, Cl. 101-5.000.

Bowman, Walker H.; and Sirovich, Bruce E., to Standard Oil Company, a corporation of Indiana. Moving bed hydride/dehydride systems. 4,178,987, Cl. 165-1.000.

Box, Stephen J.; and Hood, John D., to Beecham Group Limited. Streptomycetal antibiotic. 4,179,498, Cl. 424-117.000.

Boyce, Robert A. L. Vehicle towed display device. 4,178,706, Cl. 40-326.000.

Boyd, David C.; Hagy, Henry E.; and Thompson, David A., to Corning Glass Works. Cathode ray tube panel. 4,179,638, Cl. 313-480.000.

BP Chemicals Limited: *See—*
Huitson, John J., 4,179,522, Cl. 424-317.000.

Brachet, Roland F. C.; and Boismard, Pierre M. Installation for the animation of pictures. 4,179,198, Cl. 352-100.000.

Bradley, Robert L.; and Mauceri, Frank A., to Nalco Chemical Company. Polymer to agglomerate resolved emulsions. 4,179,369, Cl. 210-43.000.

Brady, Donnie G., to Phillips Petroleum Company. Monohaloalkenyl benzoates and trihaloalkyl benzoates. 4,179,571, Cl. 560-64.000.

Brady, Joseph F., to United States of America, Army. Dual purpose munition. 4,178,851, Cl. 102-4.000.

Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, to Carl Freudenberg, Firma; and Rohm

GmbH. Method for making water-soluble elastin hydrolyzates. 4,179,333, Cl. 435-60.000.

Brandes, Wilhelm: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, to Sigri Elektrographit GmbH. Electrode for electrochemical processes and method of producing the same. 4,179,289, Cl. 75-206.000.

Bratten, William R.; and Helfer, Joel N., to Baxter Travenol Laboratories, Inc. Diffusion device for blood. 4,179,364, Cl. 210-321.00B.

Brautigam, Hans, to Esab-Kebe GmbH. Two torch head for oxygen cutting machines. 4,179,101, Cl. 266-77.000.

Bredehoeft, Edwin L.; and Lee, Robert E. Racquet carrier. 4,179,054, Cl. 224-45.00L.

Bremer, Richard J.; and Richardson, Daniel J., to General Motors Corporation. Apparatus for oxygen sensor impedance measurement. 4,178,793, Cl. 73-23.000.

Breuer, Oswald; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Plough for winning material from a mineral face. 4,179,161, Cl. 299-34.000.

Breuers, Theo P. C.; and Joosten, Joannes J. W. M., to Oce-van der Grinten N.V. Apparatus for conveying sheetlike original material to be copied. 4,179,112, Cl. 271-3.000.

Briggs & Stratton Corporation: *See—*
Nau, Paul R., 4,178,894, Cl. 123-119.00B.

Brissonneau & Lotz Marine S. A.: *See—*
Brochard, Felix A., 4,179,149, Cl. 294-81.0SF.

Britton, John, to General Electric Company Limited, The. Circuits for operating discharge lamps. 4,179,641, Cl. 315-289.000.

Brochard, Felix A., to Brissonneau & Lotz Marine S. A. Suspended seizing device or the like. 4,179,149, Cl. 294-81.0SF.

Broersma, Frank R.; and Choca, Monica E., to Nalco Chemical Company. Method of preparing a controlled pore volume alumina with citric acid. 4,179,411, Cl. 252-465.000.

Bromell, Raymond J.; and Sideris, John N. J., to National Advanced Drilling Machines, Inc. Vertical motion compensated crane apparatus. 4,179,233, Cl. 414-139.000.

Brotz, Gunther: *See—*
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.

Brown, Floyd P.; and Narvaez, Peter D., to National Semiconductor Corporation. Programmer and method of storing information therein and accessing information therefrom. 4,179,748, Cl. 364-900.000.

Brown, Paul, to Husky Injection Molding Systems Inc. Injection mold with floating stripper ring. 4,179,254, Cl. 425-438.000.

Brown, Raymond C., to Superior Industries International, Inc. Simulated wire spoke wheel assembly. 4,179,163, Cl. 301-37.0SS.

Brown, Richard E., to Warner-Lambert Company. Indole-2-carboxylic acids to effect CNS depressant activity. 4,179,513, Cl. 424-274.000.

Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., to Bell Telephone Laboratories, Incorporated. Method for making bondable finger contacts. 4,179,322, Cl. 156-192.000.

Brunn, Hansjoachim: *See—*
Fass, Carl; and Brunn, Hansjoachim, 4,179,130, Cl. 277-84.000.

Bruno, Anthony T., to Harsco Corporation. Rail grinding system. 4,178,724, Cl. 51-178.000.

Brunswick Corporation: *See—*
Bankstahl, Herbert A., 4,178,873, Cl. 115-73.000.

Bucek, Miroslav: *See—*
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, 4,178,971, Cl. 139-435.000.

Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., to Ex-Cell-O Corporation. Roll-through cold forming apparatus. 4,178,790, Cl. 72-224.000.

Buechler, Ulrich H.; Phelps, Dennis B.; and Boswick, John A., Jr. Wrist prosthesis. 4,178,640, Cl. 3-1.910.

Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., to GTE Sylvania Incorporated. Brazing slurry. 4,179,297, Cl. 106-1.120.

Buhler-Miag GmbH: *See—*
Schnellbacher, Kurt; Muller, Klaus; and Gorlitz, Frank-Otto, 4,179,363, Cl. 209-481.000.

Bulgaru, Liliana: *See—*
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.

Buljan, Sergej-Tomislav, to GTE Sylvania Incorporated. Si_3N_4 containing intergranular phase nucleating agent and method. 4,179,301, Cl. 106-73.500.

Bunker Ramo Corporation: *See—*
Kwan, Okun; and Zaccagnino, Nicholas, 4,179,223, Cl. 400-320.000.

Burchman, Edmund K.: *See—*
Lind, Gene C.; Lind, Ralph C.; Lind, Frank L.; Burchman, Edmund K.; and Trauger, Robert, 4,178,931, Cl. 128-230.000.

Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., to Petrolite Corporation. Quaternary ammonium adducts of polymerizable tertiary ammonium salts and acrylamide. 4,179,549, Cl. 525-374.000.

Burke, Harold J., to General Motors Corporation. Adjustable steering column for vehicles. 4,179,137, Cl. 280-775.000.

Burkel, Reiner: *See—*
Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, 4,178,891, Cl. 123-117.00R.

Burkhardt, Joseph A.: *See—*
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.

Burkhart, Carol A. Solar energy teaching aid. 4,178,699, Cl. 35-10.000.

Burlington Industries, Inc.: *See—*
Wagner, Raymond L., 4,179,656, Cl. 324-166.000.

Burnham, Peter B., to Harsco Corporation. Manual operator for coiling door. 4,178,978, Cl. 160-321.000.

Burr-Brown Research Corporation: *See—*
Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., 4,179,172, Cl. 339-17.0LM.

Burroughs Corporation: *See—*
Erhardt, Heinrich S., 4,178,847, Cl. 101-91.000.
Kim, Dongsung R., 4,179,737, Cl. 364-200.000.
Quadri, Farooq M., 4,179,750, Cl. 365-8.000.
Zwingman, Robert L., 4,179,749, Cl. 365-3.000.

Burroughs Wellcome Co.: *See—*
Grivsky, Eugene M., 4,179,524, Cl. 424-324.000.
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.

Burson, Bob O., to R. E. Phelon-Company, Inc. Magneto rotor construction. 4,179,634, Cl. 310-153.000.

Burton Mechanical Contractors, Inc.: *See—*
Foreman, Brian E.; and Jones, Mark A., 4,179,371, Cl. 210-63.00R.

Bussinger, Fritz: *See—*
Alf, Herbert; and Bussinger, Fritz, 4,178,760, Cl. 60-319.000.

Butler, Donald E., to Warner-Lambert Company. New pyridobenzodioxin compounds and methods for their production. 4,179,506, Cl. 424-256.000.

Butler, Donald E., to Warner-Lambert Company. 3-Aryloxy-substituted-aminopyridines and methods for their production. 4,179,563, Cl. 544-360.000.

Butler, William S.: *See—*
Farris, Richard C.; and Butler, William S., 4,178,959, Cl. 137-493.300.

Butruille, Yves: *See—*
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

C.I.E.R. Compagnia Importazioni Esportazioni Rappresentanze S.R.L.: *See—*
Rossani, Aldo, 4,179,741, Cl. 364-457.000.

C. van der Lely N. V.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,178,997, Cl. 172-112.000.

Cadbury India Limited: *See—*
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,455, Cl. 260-409.000.
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,456, Cl. 260-409.000.

Caknis, Nicholas. Air discharge terminal unit. 4,178,840, Cl. 98-38.00E.

Campbell, Robert G.: *See—*
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.

Cann, Peter L.; Karns, Phil J.; and Honnold, Fred V., to Carrier Corporation. Control for a combination furnace and heat pump system. 4,178,988, Cl. 165-2.000.

Canon Kabushiki Kaisha: *See—*
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.
Kosugi, Masao; and Yoshinari, Hideki, 4,179,110, Cl. 270-58.000.
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Tateoka, Masamichi; and Minoura, Kazuo, 4,179,183, Cl. 350-6.100.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, 4,179,116, Cl. 271-306.000.

Canron Inc.: *See—*
Maisonneuve, Hubert, 4,178,836, Cl. 91-381.000.

Carbomedics, Inc.: *See—*
Bokros, Jack C., 4,178,639, Cl. 3-1.500.

Carborundum Company, The: *See—*
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,179,299, Cl. 106-44.000.

Carl Freudenberg, Firma: *See—*
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.

Carrier Corporation: *See—*
Cann, Peter L.; Karns, Phil J.; and Honnold, Fred V., 4,178,988, Cl. 165-2.000.
Kouse, Charles H.; and Herzog, James L., 4,178,649, Cl. 15-104.06R.

Carrillo, Leo; and Madden, Thomas C., to Bell Telephone Laboratories, Incorporated. Apparatus and method for affixing bondable finger contacts to a printed circuit board. 4,178,678, Cl. 29-625.000.

Carter, Aaron B., to Bell Telephone Laboratories, Incorporated. Noise pulse presence detection circuit. 4,179,625, Cl. 307-234.000.

Carter, Russell P., Jr., to Mobay Chemical Corporation. Thermoplastic polyurethane blends containing a processing aid. 4,179,479, Cl. 525-66.000.

Caruso, Robert: *See—*
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.

Cassell, Don S.; and Kinyon, Brice W., to Combustion Engineering, Inc. Measurement of gas-liquid flow. 4,178,801, Cl. 73-195.000.
Caterpillar Tractor Co.: *See*—
Goloff, Alexander, 4,178,725, Cl. 51-290.000.
Cato Research Corp.: *See*—
Kruesi, Paul R., 4,179,492, Cl. 423-263.000.
Catterfeld, Fritz C., to Rockwell International Corporation. Modular pump unit for multistage high pressure slurry pump. 4,179,239, Cl. 415-198.100.
Cau, Pasqualino; and Cocca, Vincenzo, to Montedison S.p.A. Dishwasher consisting of an assembly of functional units made of thermoplastic material. 4,179,307, Cl. 134-58.00D.
Cawood, Charles D., Jr.; and Ziegler, John S., to American Hospital Supply Corporation. Urological instrument with deflecting element. 4,178,920, Cl. 128-4.000.
CBS Inc.: *See*—
Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., 4,179,704, Cl. 358-22.000.
Ceraver: *See*—
Tritten, Paul, 4,179,485, Cl. 264-44.000.
Cerberus AG: *See*—
Keller, Hansjurg, 4,179,691, Cl. 340-567.000.
Chafe, William J.: *See*—
Berns, Michael S.; and Chafe, William J., 4,178,874, Cl. 116-28.00R.
Chakrabarti, Paritosh M., to GAF Corporation. Glass fiber dispersions for making uniform glass fiber mats by the wet-laid process. 4,179,331, Cl. 162-156.000.
Chambon, Rene. Method of an apparatus for extracting, measuring and adding a product. 4,179,041, Cl. 222-1.000.
Chan, Edwin T.; and Jepson, Stanley R., to Varian Associates, Inc. Xenon arc lamp with compressive ceramic to metal seals. 4,179,037, Cl. 220-2.30R.
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., to Bell Telephone Laboratories, Incorporated. Gold-tin-gold ohmic contact to N-type group III–V semiconductors. 4,179,534, Cl. 427-89.000.
Chang, Leei, to American Optical Corporation. Infrared reflecting articles. 4,179,181, Cl. 350-1.700.
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, to Santa Fe International Corporation. Automatic pipe welding apparatus and method. 4,179,059, Cl. 228-103.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Stanton, William E.; Eisenhaure, David B.; Oberbeck, George A.; and Fertig, Kenneth, 4,179,729, Cl. 363-175.000.
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V. Contact apparatus for carrying out heat-and-mass exchange processes. 4,179,487, Cl. 261-114.00R.
Chemetron Corporation: *See*—
Schmerling, Donald W., 4,179,056, Cl. 226-171.000.
Chemische Fabrik: *See*—
Barthell, Eduard; and Schmid, Otto, 4,179,367, Cl. 210-41.000.
Chemische Fabrik Stockhause & Cie: *See*—
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, 4,179,370, Cl. 210-51.000.
Chen, Jeffrey J.: *See*—
Savage, Elton S.; and Chen, Jeffrey J., 4,179,374, Cl. 210-151.000.
Cheng, George C. Graphic conversion system for electronic data processing. 4,179,684, Cl. 340-146.3AE.
Cheng, Jiin-Duey, to Du Pont de Nemours, E. I., and Company. Novel imidazothiazine-1,3 (2H)-diones. 4,179,276, Cl. 71-91.000.
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., to Firestone Tire & Rubber Company, The. Oil-free elastomeric poly(aryloxyphosphazene) copolymers. 4,179,555, Cl. 528-168.000.
Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Preparation of magnesium-containing dispersions from magnesium carboxylates. 4,179,383, Cl. 252-25.000.
Chester, James T. Apparatus to indicate bio-rhythm curves. 4,179,610, Cl. 235-89.00R.
Chevron Research Company: *See*—
Michlmayr, Manfred J., 4,179,361, Cl. 208-244.000.
Moore, Joseph E., 4,179,441, Cl. 548-122.000.
Chicago Bridge & Iron Company: *See*—
Pollack, Jack, 4,178,870, Cl. 114-230.000.
Chicago Pneumatic Tool Company: *See*—
Patel, Ghanshyam C., 4,179,250, Cl. 418-195.000.
Child, James L., Jr.; Fouss, James L.; and Nowicki, Erwin K., to Hancor, Inc. Dynamic plow assembly and method of operating same. 4,179,227, Cl. 405-182.000.
Childers, Thomas W.: *See*—
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.
Chiron, Georges, to Saint-Gobain Industries. Multimodal resonant cavity for very high frequency heating. 4,179,595, Cl. 219-10.55F.
Choca, Monica E.: *See*—
Broersma, Frank R.; and Choca, Monica E., 4,179,411, Cl. 252-465.000.
CHON Corporation: *See*—
Oppolzer, Wolfgang, 4,179,572, Cl. 560-115.000.
Christensen, Kresten, to Lonza Ltd. Pesticides for snails. 4,179,499, Cl. 424-143.000.
Christensen, Rusty S.: *See*—
Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., 4,179,172, Cl. 339-17.0LM.
Christian, Ted W.: *See*—
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., 4,178,704, Cl. 37-57.000.
Christofas, Alkis; and Dohany, Julius E., to Pennwalt Corporation. Synergistic primer for fluoropolymer coatings. 4,179,542, Cl. 428-324.000.
Christou, Aristos; and Day, Howard M., to United States of America, Navy. Multi-refractory films for gallium arsenide devices. 4,179,533, Cl. 427-84.000.
Christou, Aristos, to United States of America, Navy. Electron collector for forming low-loss electron images. 4,179,604, Cl. 250-305.000.
Chugai Seiyaku Kabushiki Kaisha: *See*—
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,179,452, Cl. 260-397.200.
Ciba-Geigy Corporation: *See*—
Franz, Gerhard; Halfter, Georg; Jaeckle, Walter; and Mindermann, Fritz, 4,179,476, Cl. 260-706.000.
Green, George E., 4,179,577, Cl. 560-52.000.
Lacroix, Roger; and Mollet, Hans, 4,179,267, Cl. 8-41.00R.
Ramanathan, Visvanathan, 4,179,435, Cl. 260-158.000.
Roth, Martin, 4,179,444, Cl. 260-326.00N.
Ciliberti, Frank L., Jr., to P. R. Mallory & Co. Inc. Battery with protectively jacketed female terminal. 4,179,545, Cl. 429-65.000.
Cincinnati Milacron Chemicals, Inc.: *See*—
Molt, Kenneth R., 4,179,432, Cl. 260-45.75S.
Cincinnati Milacron Inc.: *See*—
Jessup, Wilbur F., 4,178,719, Cl. 51-103.0TF.
Citizen Watch Company Limited: *See*—
Murakami, Tomomi; and Ichikawa, Singo, 4,178,750, Cl. 58-4.00A.
Yoshida, Hirohiko; and Nakajima, Fumio, 4,179,671, Cl. 331-116.0FE.
Clark Equipment Company: *See*—
Siewert, Robert L., 4,179,015, Cl. 188-106.00P.
Clarke, Robert L.; and Daum, Sol J., to Sterling Drug Inc. 2-Aryltropane compounds. 4,179,567, Cl. 546-124.000.
Clayton, William J.; and Kutniewski, Donald F., to Mobil Oil Corporation. Aid for kindling fires. 4,179,270, Cl. 44-40.000.
Clayton, William J., to Mobil Oil Corporation. Fatty acid diethanol amide-containing general purpose cleaner in paste form. 4,179,414, Cl. 252-548.000.
Clint, John H.: *See*—
Rudkin, Arthur L.; Clint, John H.; and Young, Kenneth, 4,179,382, Cl. 252-8.800.
Clumpner, Joseph A., to Swiss Aluminium Ltd. Apparatus for the degassing and filtration of molten metal. 4,179,102, Cl. 266-218.000.
Cobb, Raymond L.; and Fodor, Lawrence M., to Phillips Petroleum Company. Catalytic alkylation of alkyl-substituted aromatics with monoolefins. 4,179,471, Cl. 585-452.000.
Cobb, Raymond L., to Phillips Petroleum Company. Catalytic alkylation of alkyl-substituted aromatics with monoolefins. 4,179,472, Cl. 585-452.000.
Cobb, Raymond L., to Phillips Petroleum Company. Organic chemical reaction. 4,179,580, Cl. 546-349.000.
Cocca, Vincenzo: *See*—
Cau, Pasqualino; and Cocca, Vincenzo, 4,179,307, Cl. 134-58.00D.
Coefield, Nina. Crossword puzzle game. 4,179,126, Cl. 273-240.000.
Cohen, Allen I.; and Kripalani, Kishin J., to E. R. Squibb & Sons, Inc. (N-lower alkyl-3,5-dioxo-3-pyrrolidinyl)thioalkanoylpyrrolidine-and piperidine-carboxylic acid compounds. 4,179,568, Cl. 546-208.000.
Cohen, Edward M.; Grim, Wayne M.; Harwood, Richard J.; and Mehta, Gunvant N., to Merck & Co., Inc. Solid state ophthalmic medication. 4,179,497, Cl. 424-22.000.
Cohn, Arnold K. Pediatric restraint device. 4,178,926, Cl. 128-133.000.
Cole, Bert, Jr. Tool box carrying apparatus and method. 4,179,153, Cl. 296-37.100.
Cole, Herbert S., Jr.; and Aftergut, Siegfried, to General Electric Company. Dichroic dyes having a plurality of azo bonding groups. 4,179,395, Cl. 252-299.000.
Cole-Parmer Instrument Company: *See*—
Guttmann, Emil J., 4,179,249, Cl. 417-477.000.
Colibri Lighters Limited: *See*—
Lowenthal, Hans, 4,179,260, Cl. 431-255.000.
Collier, John C.; and Owen, Leonard J., to AMP Incorporated. Tool for applying bundle ties. 4,178,973, Cl. 140-123.600.
Colombani, Piero. Liquid transferring device. 4,179,045, Cl. 222-590.000.
Colt Industries Operating Corp.: *See*—
Fuller, William A., 4,179,245, Cl. 417-292.000.
Combustion Engineering, Inc.: *See*—
Cassell, Don S.; and Kinyon, Brice W., 4,178,801, Cl. 73-195.000.
Savor, Dennis E.; and Rohrberg, Roderick G., 4,178,966, Cl. 138-89.000.
Cometta, Robert A.: *See*—
Compton, James B.; Cometta, Robert A.; and Culmer, Daniel D., 4,179,310, Cl. 148-1.500.
Comiskey, Gary F.: *See*—
Karlin, Richard A.; McDonald, Robert W.; and Comiskey, Gary F., 4,179,649, Cl. 320-13.000.
Commissariat a l'Energie Atomique: *See*—
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, 4,179,035, Cl. 414-2.000.
Compagnie Generale des Etablissements Michelin: *See*—
Sauvage, Philippe, 4,178,985, Cl. 164-250.000.
Compagnie International pour l'Informatique Cii-Honeywell Bull: *See*—
Bailly, Emile, 4,179,014, Cl. 188-43.000.

Compton, James B.; Cometta, Robert A.; and Culmer, Daniel D., to National Semiconductor Corporation. Laser trim protection process. 4,179,310, Cl. 148-1.500.

Concord Laboratories, Inc.: *See*—
Raitto, Russell G., 4,178,941, Cl. 128-763.000.

Condon, Michael E.: *See*—
Ondetti, Miguel A.; and Condon, Michael E., 4,179,434, Cl. 260-112.50R.

Cone, Bryan N.; and Aboussouan, Michael F., to Aboussouan, Michael F. Level-indicating putter. 4,179,125, Cl. 273-162.00B.

Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, to Warner-Lambert Company. Process for the production of 2-substituted chromones. 4,179,447, Cl. 260-345.200.

Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., to Sciaky Bros., Inc. Method and apparatus for heat treating. 4,179,316, Cl. 148-152.000.

Conoco, Inc.: *See*—
Stafford, Jay H., 4,178,838, Cl. 92-117.00A.

Conrad, Coleman W.; and Fenska, Edward W., to IMC Magnetics Corporation. Safety arming device for missiles. 4,179,150, Cl. 294-83.00R.

Conrad, Jens: *See*—
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Conrad, Raymond W., to United States of America, Army. Laser plasmatron. 4,179,599, Cl. 219-121.00P.

Consolidated Foods Corporation: *See*—
Sablich, Milan; and Bedard, Eugene J., 4,179,373, Cl. 210-98.000.

Consolidated Natural Gas Service Company, Inc.: *See*—
Swenson, Paul F.; and Moore, Paul B., 4,178,772, Cl. 62-238.000.

Construction Specialties, Inc.: *See*—
Hallock, Edward C.; Olsen, Robert; and Ennesser, George, 4,178,738, Cl. 52-663.000.

Consul S. A.: *See*—
Almen, Karl-Gosta, 4,178,774, Cl. 62-493.000.

Cook, Billy G. Ion repulsion engine and method of operating same. 4,178,759, Cl. 60-721.000.

Cook Electric Company: *See*—
Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., 4,179,170, Cl. 339-14.00R.

Cook, James S., to General Electric Company. Optocoupler having internal reflection and improved isolation capabilities. 4,179,619, Cl. 250-551.000.

Cooper, Glen D.: *See*—
Ying, Sui-chun; and Cooper, Glen D., 4,178,777, Cl. 64-13.000.

Cooper, Thomas W.; and Taylor, Ernest E., to Dresser Industries, Inc. Seal for a rolling cone cutter earth boring bit. 4,179,003, Cl. 175-371.000.

Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., to Carborundum Company, The. Sintered alpha silicon carbide ceramic body having equiaxed microstructure. 4,179,299, Cl. 106-44.000.

Cornell, William D. Teaching system. 4,178,698, Cl. 35-8.00A.

Corning Glass Works: *See*—
Bockstie, Lawrence G., Jr., 4,179,477, Cl. 525-284.000.
Boyd, David C.; Hagy, Henry E.; and Thompson, David A., 4,179,638, Cl. 313-480.000.
Hawk, Robert M., 4,179,185, Cl. 350-96.160.
Maurer, Robert D., 4,179,187, Cl. 350-96.300.

Cornwell, Lionel B. Automatic blood pressure measuring and recording system. 4,178,918, Cl. 128-682.000.

Cory Food Services, Inc.: *See*—
Vitous, Charles J., 4,178,842, Cl. 99-281.000.

Cosme, Peter A. Safety bed. 4,178,645, Cl. 5-426.000.

Courshon, Jacob B., Jr., to Harbin, High, a part interest. Full feathering, reversible pitch, constant RPM propeller. 4,179,241, Cl. 416-137.000.

Coviello, Allan J.; Bernardin, Frederick E., Jr.; and Rohrkemper, Robert R., to Thetford Corporation. Apparatus for sanitizing liquids with ultra-violet radiation and ozone. 4,179,616, Cl. 250-527.000.

Cox, James E., Jr. Valve for inflatable prosthesis. 4,178,643, Cl. 3-36.000.

Cox, Robert P., to Lummus Company, The. Production of monoalkyl aromatics. 4,179,473, Cl. 585-313.000.

Coyle, Forrest E.; and Mandel, Alan F., to Westinghouse Electric Corp. Illuminated pushbutton assembly. 4,179,594, Cl. 200-310.000.

Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., to Wear-Ever Aluminum, Inc. Portable corn popper. 4,178,843, Cl. 99-323.800.

Cranstoun, David: *See*—
Pratt, Harry H.; and Cranstoun, David, 4,178,881, Cl. 122-235.00A.

Crawford, Richard R., to Eastman Kodak Company. Conversion of fatty acid esters to fatty acids. 4,179,457, Cl. 260-418.000.

Crean, Peter A.; Lavallee, Pierre A.; and Agulnek, Martin A., to Xerox Corporation. Scanning apparatus. 4,179,621, Cl. 250-566.000.

Crepaco, Inc.: *See*—
Wakeman, Alden H., 4,178,773, Cl. 62-341.000.

Crespi, Carlo. Dispensing device actuated by a receiving member. 4,178,975, Cl. 141-362.000.

Creusot-Loire: *See*—
Rachais, Claude, 4,179,075, Cl. 241-67.000.

Cross, Peter E.: *See*—
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,520, Cl. 424-309.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,521, Cl. 424-309.000.

Crowell, Robert B., to United States of America, Army. Automatic gun having gas leakage control mechanism. 4,178,832, Cl. 89-159.000.

Croyle, Jack V.: *See*—
Bateman, Robert F.; and Croyle, Jack V., 4,179,040, Cl. 220-410.000.

Crystal Systems, Inc.: *See*—
Schmid, Frederick, 4,178,670, Cl. 29-417.000.

Cucinella, Salvatore: *See*—
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, 4,179,459, Cl. 260-448.00R.

Culmer, Daniel D.: *See*—
Compton, James B.; Cometta, Robert A.; and Culmer, Daniel D., 4,179,310, Cl. 148-1.500.

Cummins, Donald L.; and Stahura, Daniel W., to General Motors Corporation. Dual output battery charging system. 4,179,647, Cl. 320-6.000.

Cunningham, Louise B. Restraining device for animals. 4,178,879, Cl. 119-106.000.

Cunningham, Paul B. Diesel truck road speed control. 4,178,901, Cl. 123-198.00D.

Curlee, James D. Therapeutic belt. 4,178,922, Cl. 128-78.000.

Curlee, James D. Therapeutic corset. 4,178,923, Cl. 128-78.000.

Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., to Upjohn Company, The. Portable, expandable mold for fabricating substantially isotropic isocyanate based polymer foam buns. 4,179,094, Cl. 249-82.000.

CVG-Siderurgica del Orinoco, C.A.: *See*—
Rubio, Charles A., 4,179,282, Cl. 75-35.000.

Cwirzen, Casimir: *See*—
Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., 4,179,170, Cl. 339-14.00R.

Dahl, Helmut: *See*—
Weber, Alfred; Kennecke, Mario; and Dahl, Helmut, 4,179,336, Cl. 435-55.000.

Dahmen, Kurt: *See*—
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, 4,179,370, Cl. 210-51.000.

Dainippon Ink & Chemicals Inc.: *See*—
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.

D'Amico, John J.: *See*—
Bollinger, Frederic G.; and D'Amico, John J., 4,179,466, Cl. 260-558.00A.

Danfoss A/S: *See*—
Karll, Bent, 4,178,771, Cl. 62-200.000.

Daniel, Danny O. Method and apparatus for correcting bent axle misalignment. 4,178,791, Cl. 72-388.000.

Daniels, George R.; and Henneberg, Helmut, to Honeywell Information Systems Inc. Facade for a data processing system. 4,179,169, Cl. 312-257.00R.

Danilewicz, John C.: *See*—
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,520, Cl. 424-309.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,521, Cl. 424-309.000.

Dankert, Harry S., to Upjohn Company, The. Torque open capping chuck improvement. 4,178,733, Cl. 53-331.500.

Danziger, Harry L. Apparatus for reclaiming used lubricating oils. 4,179,019, Cl. 196-46.100.

Dart Industries Inc.: *See*—
Bateman, Robert F.; and Croyle, Jack V., 4,179,040, Cl. 220-410.000.

Das, Subodh K., to Aluminum Company of America. Controlled wettability graphite electrodes for selective use in electrolysis cells. 4,179,345, Cl. 204-67.000.

Das, Subodh K.; and Boget, Paul J., to Aluminum Company of America. Selective use of wettable and non-wettable graphite electrodes in electrolysis cells. 4,179,346, Cl. 204-67.000.

Daskalov, Hristo P.: *See*—
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., 4,179,460, Cl. 260-455.00R.

DataProducts Corporation: *See*—
Khan, Sultan W.; Ham, John K.; and Strissel, Richard A., 4,179,732, Cl. 364-200.000.

Dau, Wolfram, to Volkswagenwerk Aktiengesellschaft. Vehicle fuel tank. 4,178,955, Cl. 137-264.000.

Daubenbuchel, Werner: *See*—
Hess, Dieter; Friedrichs, Carsten; and Daubenbuchel, Werner, 4,179,251, Cl. 425-140.000.

Daum, Sol J.: *See*—
Clarke, Robert L.; and Daum, Sol J., 4,179,567, Cl. 546-124.000.

David Brown Tractors Limited: *See*—
Alderman, William; and Hodgson, Eric C., 4,179,016, Cl. 192-4.00A.

Davidson, Stan: *See*—
Gallina, Salvatore; and Davidson, Stan, 4,178,821, Cl. 84-1.010.

Davies, Michael; Hourihan, Glyn; and Smith, Frank, to Imperial Chemical Industries Limited. Corrosion monitoring probe. 4,179,653, Cl. 324-65.0CR.

Davila, Efrain A.: *See*—
Staats, Henry N.; Schmidt, Waldemar M.; and Davila, Efrain A., 4,179,325, Cl. 156-498.000.

Davis, Edward H.: *See—*
Anderson, Vaughn R.; Woolley, Ronald L.; and Davis, Edward H., 4,178,882, Cl. 123-1.00A.
Davis, Frank F.; Van Es, Theodorus; and Palczuk, Nicholas C. Non-immunogenic polypeptides. 4,179,337, Cl. 435-181.000.
Davis, Richard P., to Teradyne, Inc. Analyzing electrical circuit boards. 4,179,652, Cl. 324-64.000.
Davy International (Oil & Chemicals) Limited: *See—*
Young, William, 4,179,234, Cl. 414-268.000.
Day, Howard M.: *See—*
Christou, Aristos; and Day, Howard M., 4,179,533, Cl. 427-84.000.
Dearborn Fabricating & Engineering Company: *See—*
Dunville, Martin, 4,178,856, Cl. 104-95.000.
Deborski, Gary A., to Dow Chemical Company, The. Catalytically innate electrode(s). 4,179,350, Cl. 204-284.000.
De Capitani, Francesco. Cigarettes having an individual lighting means, and method of making thereof. 4,178,945, Cl. 131-23.00R.
Deepsea Ventures, Inc.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., 4,178,704, Cl. 37-57.000.
Deere & Company: *See—*
Smemo, Alfred S., 4,178,813, Cl. 74-764.000.
West, Neil L., 4,178,943, Cl. 130-27.00T.
De Gasperi, Mario M.: *See—*
Bonicalzi, Maria P.; and De Gasperi, Mario M., 4,179,686, Cl. 340-146.3AG.
De Gryse, Jean-Claude, to Naamloze Vennootschap Declametaal. Twisting and cutting device for binding at least one thread put around a pressed bale. 4,178,845, Cl. 100-11.000.
Deinet, Adolph J.: *See—*
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.
Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,179,575, Cl. 562-506.000.
den Hollander, Willem, to RCA Corporation. Raster correction circuit with low dissipation resistive damping. 4,179,642, Cl. 315-370.000.
Denka Chemical Corporation: *See—*
Barone, Bruno J., 4,179,404, Cl. 252-435.000.
Dennison Manufacturing Company: *See—*
Russell, David B., 4,179,063, Cl. 227-67.000.
Derby, Palmer P., to Raytheon Company. Anode assembly for electron discharge devices. 4,179,639, Cl. 315-39.690.
Deutsch Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Schmieder, Lothar; Vilgertshofer, August; and Mettin, Florian, 4,178,799, Cl. 73-141.00A.
Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co. Ltd. Musical tone synthesizer for generating a marimba effect. 4,178,825, Cl. 84-1.240.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Knosp, Helmut, 4,179,286, Cl. 75-134.00N.
Rothbuhr, Lothar; and Voll, Manfred, 4,179,494, Cl. 423-456.000.
Deutsche Gold-und Silber-Scheideanstalt vormals Rosseler: *See—*
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.
Development Finance Corporation of New Zealand: *See—*
Skinner, Robert I.; and Heine, Arnold J., 4,179,104, Cl. 267-154.000.
de Vries, Jacobus, to Ammeral Nederland B.V. Belt conveyor. 4,179,026, Cl. 198-834.000.
Dewar, George H.: *See—*
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.
Deyoe, Charles W.: *See—*
Sieb, Paul A.; Deyoe, Charles W.; and Hoseney, Russell C., 4,179,445, Cl. 260-340.90R.
Dhar, Nirmal C.: *See—*
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.
Diaconescu, Constantin: *See—*
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.
Diaconu, Eugen: *See—*
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.
Dicalite Europe Nord, S.A.: *See—*
Vancauwenberghe, Gerard R., 4,179,264, Cl. 432-13.000.
Dickey, Avis M., to Dickey, Inc. Bible board with bible cutouts. 4,178,700, Cl. 35-23.00R.
Dickey, Inc.: *See—*
Dickey, Avis M., 4,178,700, Cl. 35-23.00R.
Didier-Werke A.G.: *See—*
Jeschke, Peter; and Gelsdorf, Gunter, 4,179,046, Cl. 222-600.000.
Dijkmans, Eise C.: *See—*
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,179,687, Cl. 340-347.0AD.
Dikstein, Shabtay: *See—*
Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, 4,179,517, Cl. 424-283.000.
Dillenburg, Helmut; Dotsch, Werner; and Siegel, Rudolf, to Peroxid-Chemie GmbH. Process for improving the storage stability of alkali persalts. 4,179,394, Cl. 252-186.000.
Dilman, Viktor V.: *See—*
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V., 4,179,487, Cl. 261-114.00R.
Dimeo, Franklin R.: *See—*
Bachman, William J.; and Dimeo, Franklin R., 4,179,178, Cl. 339-111.000.
Dionne, Gervais: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.
Display Corporation International: *See—*
Isaac, L. Henry; Nowak, Edward J.; and Schmitz, Charles R., 4,179,168, Cl. 312-125.000.
Dixon, Alexander F. H.: *See—*
Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., 4,179,611, Cl. 235-92.0QC.
Dlugos, Daniel F., to Pitney-Bowes, Inc. Mailing system. 4,179,747, Cl. 364-900.000.
Dodson, George B.; and Nangeroni, John A., to Bose Corporation. Amplifying and equalizing. 4,179,669, Cl. 330-282.000.
Dohany, Julius E.: *See—*
Christofas, Alkis; and Dohany, Julius E., 4,179,542, Cl. 428-324.000.
Doma, Katsuharu: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.
Dombrowski, Norman, to National Research Development Corporation. Liquid spray devices. 4,179,068, Cl. 239-13.000.
Domtar Inc.: *See—*
Lightfoot, Herbert D., 4,179,253, Cl. 425-369.000.
Donaldson, Robert M.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., 4,178,704, Cl. 37-57.000.
Doolittle, Robert E.: *See—*
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., 4,179,446, Cl. 260-343.600.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Nagai, Akinori, 4,178,795, Cl. 73-61.0LM.
Dotsch, Werner: *See—*
Dillenburg, Helmut; Dotsch, Werner; and Siegel, Rudolf, 4,179,394, Cl. 252-186.000.
Dow Chemical Company, The: *See—*
Deborski, Gary A., 4,179,350, Cl. 204-284.000.
Garner, Joseph L.; and Tiffany, Peter A., 4,179,546, Cl. 521-56.000.
Nelson, Linnea E.; and Reineke, Charles E., 4,179,298, Cl. 106-18.210.
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, to ANIC S.p.A. Process for the synthesis of mixed polyimino derivatives of aluminium and alkaline earth metals. 4,179,459, Cl. 260-448.00R.
Dragerwerk Aktiengesellschaft: *See—*
Warncke, Ernst, 4,178,961, Cl. 137-495.000.
Draper, Cassius W.: *See—*
Hendricks, Fred; and Draper, Cassius W., 4,179,120, Cl. 273-49.000.
Dravo Corporation: *See—*
Savage, Elton S.; and Chen, Jeffrey J., 4,179,374, Cl. 210-151.000.
Dresser Industries, Inc.: *See—*
Cooper, Thomas W.; and Taylor, Ernest E., 4,179,003, Cl. 175-371.000.
Mitchell, Howard E.; and Saxman, William C., 4,179,000, Cl. 175-53.000.
Young, James W., 4,179,002, Cl. 175-297.000.
D'Silva, Themistocles D. J., to Union Carbide Corporation. Ketoalkanesulfenyl and ketoalkanethiosulfenyl carbamates. 4,179,514, Cl. 424-277.000.
DSO "Pharmachim": *See—*
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., 4,179,460, Cl. 260-455.00R.
Dube, Ghyslain: *See—*
Zwicker, James D.; and Dube, Ghyslain, 4,178,796, Cl. 73-61.400.
Du Broff, Warren, to Lathrop Paulson Company. Construction for applying tape. 4,178,739, Cl. 53-588.000.
Dunham-Bush, Inc.: *See—*
Shaw, David N., 4,178,767, Cl. 62-155.000.
Shaw, David N., 4,179,248, Cl. 417-427.000.
Dunville, Martin, to Dearborn Fabricating & Engineering Company. Wheel assembly for overhead conveyor. 4,178,856, Cl. 104-95.000.
Du Pont de Nemours, E. I., and Company: *See—*
Cheng, Jiin-Duey, 4,179,276, Cl. 71-91.000.
Hale, Alan D., 4,179,255, Cl. 425-67.000.
Dustmann, Cord-Henrich; Schmidt, Curt; and Pasztor, Gabriel, to Kernforschungszentrum Karlsruhe GmbH. Method for treating a superconductor. 4,178,676, Cl. 29-599.000.
Dynabrade, Inc.: *See—*
Fleckenstein, Elwin H.; and Welsch, Walter N., 4,178,723, Cl. 51-170.0EB.
E M I Limited: *See—*
Voles, Roger, 4,179,672, Cl. 332-16.00R.
E. R. Squibb & Sons, Inc.: *See—*
Cohen, Allen I.; and Kripalani, Kishin J., 4,179,568, Cl. 546-208.000.
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold R., 4,179,564, Cl. 546-64.000.
Krapcho, John; and Schwartz, Joseph, 4,179,558, Cl. 544-174.000.
Ondetti, Miguel A.; and Condon, Michael E., 4,179,434, Cl. 260-112.50R.

Vogt, B. Richard, 4,179,561, Cl. 544-250.000.
Earnest, Ernest R., to Hydragon Corporation, The. Throttleable turbine engine. 4,178,754, Cl. 60-39.030.
Eastman Kodak Company: *See*—
Crawford, Richard R., 4,179,457, Cl. 260-418.000.
Esders, Theodore W.; Goodhue, Charles T.; and Michrina, Christine A., 4,179,334, Cl. 195-30.000.
Hage, Charles T., 4,179,215, Cl. 355-50.000.
Losee, David L.; and Wilder, Alvin D., 4,179,528, Cl. 427-9.000.
Sassenhausen, Herbert R., 4,179,538, Cl. 430-213.000.
Eaton Corporation: *See*—
Keane, William J.; and Mezak, John A., 4,179,674, Cl. 333-204.000.
Eaton, Homer L.: *See*—
Zollweg, Richard T.; and Eaton, Homer L., 4,178,788, Cl. 72-154.000.
Eaton-Leonard Corporation: *See*—
Zollweg, Richard T.; and Eaton, Homer L., 4,178,788, Cl. 72-154.000.
Ebbinge, Willem, to National Controls, Inc. Force multiplying load cell. 4,179,004, Cl. 177-211.000.
Eberhard Hoesch & Sohne GmbH & Co.: *See*—
Schotten, Alfons; and Spolgen, Hermann J., 4,179,377, Cl. 210-230.000.
Eberle, John H.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,178,897, Cl. 123-122.00E.
Eberlein, Wolfgang: *See*—
Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, 4,179,508, Cl. 424-258.000.
Eckmayer, Zdenek: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.
Econo-Cooler, Inc.: *See*—
Fox, Lyle, 4,178,770, Cl. 62-186.000.
Economy Forms Corporation: *See*—
Jennings, Ralph L., 4,178,729, Cl. 52-284.000.
Edamura, Mizuo: *See*—
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,617, Cl. 250-531.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,618, Cl. 250-531.000.
Ediny, Jury G.: *See*—
Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M., 4,178,935, Cl. 128-328.000.
Edwards, Douglas C.; and Sato, Kyosaku, to Polysar Limited. Silica filled vulcanizates. 4,179,421, Cl. 260-23.70M.
Effron, Edward, to Exxon Research & Engineering Co. Coal liquefaction process. 4,179,352, Cl. 208-8.0LE.
Eickhoff, Heinz: *See*—
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-27.000.
Eisenhaure, David B.: *See*—
Stanton, William E.; Eisenhaure, David B.; Oberbeck, George A.; and Fertig, Kenneth, 4,179,729, Cl. 363-175.000.
Electric Furnace Company, The: *See*—
Zeigler, Jon G.; Kerr, Elmer L.; and Bell, David V., 4,179,603, Cl. 219-538.000.
Electric Power Research Institute: *See*—
Ying, Sui-chun; and Cooper, Glen D., 4,178,777, Cl. 64-13.000.
Electric Power Research Institute, Inc.: *See*—
Garcia, Felipe G., 4,179,582, Cl. 174-15.0BH.
Hildebrand, B. Percy; and Posakony, Gerald J., 4,179,683, Cl. 367-138.000.
Elgin Sweeper Company: *See*—
Wolynec, John J.; Hildebrand, Donald L.; and Wasynczuk, Victor, 4,178,647, Cl. 15-84.000.
Eltra Corporation: *See*—
Hayes, James L.; and Greenslade, John T., 4,179,030, Cl. 206-396.000.
Emmerson, John O.: *See*—
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.
Endo, Masayasu: *See*—
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, 4,179,624, Cl. 307-3.000.
Engelsmann, Dieter: *See*—
Stemme, Otto; Lermann, Peter; Engelsmann, Dieter; and Went, Werner, 4,179,028, Cl. 206-316.000.
Ennesser, George: *See*—
Hallock, Edward C.; Olsen, Robert; and Ennesser, George, 4,178,738, Cl. 52-663.000.
Erb, Robert A., to Franklin Institute, The. Header for a solar energy collection system. 4,178,914, Cl. 126-449.000.
Erbeia, Angelo. New process for preparing pharmaceutical, cosmetic or diagnostic formulations. 4,178,695, Cl. 34-5.000.
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., to Boeing Company, The. Particle size analyzer. 4,179,218, Cl. 356-336.000.
Erhardt, Heinrich S., to Burroughs Corporation. Item endorsing apparatus. 4,178,847, Cl. 101-91.000.
Ermanis, Felix: *See*—
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.
Ernest, Michael V.: *See*—
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., 4,179,408, Cl. 252-448.000.
Esab-Kebe GmbH: *See*—
Brautigam, Hans, 4,179,101, Cl. 266-77.000.
Esders, Theodore W.; Goodhue, Charles T.; and Michrina, Christine A., to Eastman Kodak Company. Hydrolysis of protein-bound triglycerides. 4,179,334, Cl. 195-30.000.
Eskeli, Michael. Thermodynamic compressor method. 4,178,766, Cl. 62-88.000.
Etablissements Gergonne: *See*—
Gergonne, Pierre, 4,178,658, Cl. 16-86.00A.
Etat Francais as represented by the Delegue General pour l'armement: *See*—
Robert, Andre J.; Filippini, Jean C.; and Ferre, Michel, 4,179,217, Cl. 356-33.000.
Etoh, Terukazu: *See*—
Watanabe, Hisao; and Etoh, Terukazu, 4,179,605, Cl. 250-311.000.
Ettenberg, Michael: *See*—
Olsen, Gregory H.; and Ettenberg, Michael, 4,179,308, Cl. 136-89.0GA.
Eue, Ludwig: *See*—
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Evans, F. David, to Kimwood Corporation. Apparatus for sizing and finishing batches of lumber. 4,178,721, Cl. 51-139.000.
Evans, Gregory W.; and Paul, James E., to Rockwell Internation Corporation. Autonomous, check-pointing, navigational system for an airborne vehicle. 4,179,693, Cl. 343-5.0MM.
Ex-Cell-O Corporation: *See*—
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.
Exxon Production Research Company: *See*—
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., 4,178,992, Cl. 166-117.600.
Exxon Research & Engineering Co.: *See*—
Effron, Edward, 4,179,352, Cl. 208-8.0LE.
Gladrow, Elroy M.; and Wheelock, Kenneth S., 4,179,409, Cl. 252-455.00Z.
Makowski, Henry S.; and O'Farrell, Charles P., 4,179,422, Cl. 260-28.50B.
F. D. Graphics, Inc.: *See*—
Gallimore, Claris C., 4,179,113, Cl. 271-12.000.
Failli, Amedeo: *See*—
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.
Fairchild, Peter T.; and Leininger, Joel C., to International Business Machines Corporation. Programmable control latch mechanism for a data processing system. 4,179,738, Cl. 364-200.000.
Fankhauser, Peter: *See*—
Schulte-Elte, Karl-Heinrich; Fankhauser, Peter; and Ohloff, Gunther, 4,179,448, Cl. 260-346.110.
Farha, Floyd E., Jr.: *See*—
Hutson, Thomas, Jr.; and Farha, Floyd E., Jr., 4,179,353, Cl. 208-65.000.
Farnworth, Ivan A.; and Farnworth, Ivan R. Safety socket. 4,179,175, Cl. 339-42.000.
Farnworth, Ivan R.: *See*—
Farnworth, Ivan A.; and Farnworth, Ivan R., 4,179,175, Cl. 339-42.000.
Faroudja, Yves C. Method and apparatus for separation of chrominance and luminance with adaptive comb filtering in a quadrature modulated color television system. 4,179,705, Cl. 358-31.000.
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., to Minnesota Mining and Manufacturing Company. Fluid dispensing piston. 4,179,050, Cl. 222-386.000.
Farrell, James L.: *See*—
Quesinberry, Elmen C.; Tom, Michael; and Farrell, James L., 4,179,696, Cl. 343-7.400.
Farrington, Alan: *See*—
Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, 4,178,861, Cl. 162-72.000.
Farris, Richard C.; and Butler, William S., to Halliburton Company. Fluid truck snubber. 4,178,959, Cl. 137-493.300.
Fass, Carl; and Brunn, Hansjoachim, to Intertrac Viehmann & Co., Firma. Seal assembly for track-segment pivot. 4,179,130, Cl. 277-84.000.
Fauke, Allen R.: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,179,549, Cl. 525-374.000.
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, to Laboratoires Sarget. Method and composition for reducing serum lipid levels using p-chlorophenyl p-chlorophenoxyisobutyrate. 4,179,519, Cl. 424-308.000.
Feldman, Edward; and Guenther, Heinz R., to Perkin-Elmer Corporation, The. Self-centering pressure roller for sheet feeding mechanism. 4,179,224, Cl. 400-637.000.
Felice, Patrick E.; Gonzalez, Joseph L.; and Seidel, John G., to Westinghouse Electric Corp. Thermoluminescent dosimeter system. 4,179,614, Cl. 250-253.000.
Felter, John V. Solar heating system. 4,178,912, Cl. 126-452.000.
Felton, John C.; Badmin, John S.; and Twydell, Roland S., to Shell Oil Company. Synergistic pesticidal composition. 4,179,518, Cl. 424-300.000.

Feniou, Claude: *See*—
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.

Fenska, Edward W.: *See*—
Conrad, Coleman W.; and Fenska, Edward W., 4,179,150, Cl. 294-83.00R.

Ferre, Michel: *See*—
Robert, Andre J.; Filippini, Jean C.; and Ferre, Michel, 4,179,217, Cl. 356-33.000.

Fertig, Kenneth: *See*—
Stanton, William E.; Eisenhaure, David B.; Oberbeck, George A.; and Fertig, Kenneth, 4,179,729, Cl. 363-175.000.

Fethke, Wayne G.; and Mayer, Paul C., to Fiskars Manufacturing Corporation. Functional blister package for snipper-type scissors. 4,179,029, Cl. 206-349.000.

Fiat-Allis Construction Machinery, Inc.: *See*—
Boersma, Richard F., 4,179,024, Cl. 198-806.000.

Fiedler, Frank, Jr. Safety shut-off valve. 4,179,097, Cl. 251-130.000.

Fieldhouse, John W.: *See*—
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., 4,179,555, Cl. 528-168.000.

Figura, Gene B. Awning for back pack. 4,179,053, Cl. 224-190.000.

Filippini, Jean C.: *See*—
Robert, Andre J.; Filippini, Jean C.; and Ferre, Michel, 4,179,217, Cl. 356-33.000.

Fillman, Russell L., to Woodford Manufacturing Company. Self-draining sill cock assembly. 4,178,956, Cl. 137-360.000.

Filterwerk Mann & Hummel GmbH: *See*—
Alf, Herbert; and Bussinger, Fritz, 4,178,760, Cl. 60-319.000.

Finch, George W.: *See*—
Strom, John R.; Finch, George W.; and Weyrick, Harvey W., 4,179,222, Cl. 366-337.000.

Finnemore, Fred M.; and Goodwin, Robert A., to Polaroid Corporation. Strobe-light apparatus for use with photographic camera. 4,179,205, Cl. 354-145.000.

Firester, Arthur H.: *See*—
Sheng, Ping; and Firester, Arthur H., 4,179,708, Cl. 358-128.000.

Firestone Tire & Rubber Company, The: *See*—
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., 4,179,555, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,179,553, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,179,554, Cl. 528-168.000.
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Verghese, George T., 4,179,321, Cl. 156-118.000.

Firl Industries, Inc.: *See*—
Mitchell, Robert D., 4,179,379, Cl. 210-242.00R.

Firmenich, S.A.: *See*—
Schulte-Elte, Karl-Heinrich; Fankhauser, Peter; and Ohloff, Gunther, 4,179,448, Cl. 260-346.110.

Fischbach, Wolfgang, to Heinrich Baumgarten,Eisen- und Blechenwaren Fabrik. Pot handle. 4,179,146, Cl. 294-27.00H.

Fischer, Alfred: *See*—
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.

Fischer, John, to Koppers Company, Inc. Rotary valve apparatus. 4,179,043, Cl. 222-368.000.

Fisher, Frank R., Jr. Combined cap and needle structure. 4,178,930, Cl. 128-215.000.

Fiskars Manufacturing Corporation: *See*—
Fethke, Wayne G.; and Mayer, Paul C., 4,179,029, Cl. 206-349.000.

Fisons Limited: *See*—
Harper, Douglas C.; and Attenburrow, Derek C., 4,178,716, Cl. 147-62.000.

Fitte, Daniel, to Rical, S.A. Closure cap for pouring or dispensing tops of bottles or similar receptacles. 4,179,044, Cl. 222-551.000.

Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR: *See*—
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.

Flagg, John F.; and Antos, George J., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,179,360, Cl. 208-139.000.

Flaum, Dennis M.; and Fleishman, H. Lawrence. Modular bean bag seating devices. 4,179,158, Cl. 297-118.000.

Flavel, Malcolm D., to Allis-Chalmers Corporation. Method of controlling feed rate to crushing plant while crushers are adjusted to continually operate at full power. 4,179,074, Cl. 241-24.000.

Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, to Sandoz Ltd. Paraphenyl stilbene derivatives. 4,179,578, Cl. 560-76.000.

Fleckenstein, Elwin H.; and Welsch, Walter N., to Dynabrade, Inc. Guide wheels for belt grinder. 4,178,723, Cl. 51-170.0EB.

Fleishman, H. Lawrence: *See*—
Flaum, Dennis M.; and Fleishman, H. Lawrence, 4,179,158, Cl. 297-118.000.

Fletcher, Paul C.; and Soltan, Parviz, to United States of America, Navy. Fiber optic visual display system. 4,178,708, Cl. 40-451.000.

Floating Point Systems, Inc.: *See*—
O'Leary, George P., 4,179,734, Cl. 364-200.000.

Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., to American Cyanamid Company. Novel hydroxy substituted 15-deoxy-5-cis-prostenoic acids and esters. 4,179,451, Cl. 260-395.000.

Floyd, Middleton B., Jr.: *See*—
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.

FMC Corporation: *See*—
Persoons, Gustaaf M.; and Wijts, Corneel C., 4,178,743, Cl. 56-12.900.

Fodor, Lawrence M.: *See*—
Cobb, Raymond L.; and Fodor, Lawrence M., 4,179,471, Cl. 585-452.000.

Folser, Karl: *See*—
Theurer, Josef; and Folser, Karl, 4,178,995, Cl. 171-16.000.

Ford Aerospace and Communications Corporation: *See*—
Smetana, Daryl L., 4,178,775, Cl. 62-514.0JT.

Ford, Alan T.; and Graf, Norman G. Machine for use in pictorial drafting. 4,178,709, Cl. 40-471.000.

Ford Motor Company: *See*—
Gandhi, Haren S.; Shelef, Mordecai; and Wynblatt, Paul P., 4,179,413, Cl. 252-472.000.

Foreman, Brian E.; and Jones, Mark A., to Burton Mechanical Contractors, Inc. Vacuum sewage system. 4,179,371, Cl. 210-63.00R.

Forman, Donald B.; and Holma, Gary M., to United States of America, Navy. Grinding and polishing tool. 4,178,722, Cl. 51-170.00T.

Forman, Hugh M., to G. D. Searle & Co. Urine meter and collection assembly. 4,178,934, Cl. 128-295.000.

Fortunato, Alfred J.: *See*—
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.

Foskett, Raymond: *See*—
Williams, Alfred S.; and Foskett, Raymond, 4,179,090, Cl. 248-235.000.

Foster Wheeler Energy Corporation: *See*—
Pratt, Harry H.; and Cranstoun, David, 4,178,881, Cl. 122-235.00A.

Four Star Corporation: *See*—
Ingram, Charles E., 4,179,154, Cl. 296-91.000.

Fouss, James L.: *See*—
Child, James L., Jr.; Fouss, James L.; and Nowicki, Erwin K., 4,179,227, Cl. 405-182.000.

Fox, Lyle, to Econo-Cooler, Inc. Cold air flow c .trol apparatus. 4,178,770, Cl. 62-186.000.

Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, to Commissariat a l'Energie Atomique. Balanced articulated manipulator. 4,179,035, Cl. 414-2.000.

Frank, Gerhard; and Kucharczyk, Eckhard, to Siegenia-Frank AG. Air vent. 4,178,841, Cl. 98-98.000.

Frank, Robert I.: *See*—
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,179,318, Cl. 148-187.000.

Frankenberg, Alfred A., to Robertshaw Controls Company. Pneumatically operated actuator and method of making the same. 4,178,837, Cl. 91-387.000.

Franklin Institute, The: *See*—
Erb, Robert A., 4,178,914, Cl. 126-449.000.

Franz, Gerhard; Halfter, Georg; Jaeckle, Walter; and Mindermann, Fritz, to Ciba-Geigy Corporation. Semi-continuous process for obtaining amino compounds. 4,179,476, Cl. 260-706.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Folser, Karl, 4,178,995, Cl. 171-16.000.

Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., to Gulf Research and Development Company. Combination residual oil hydrodesulfurization and catalytic cracking process. 4,179,354, Cl. 208-89.000.

Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., to Gulf Research and Development Company. Combination residual oil hydrodesulfurization and thermal cracking process. 4,179,355, Cl. 208-89.000.

French, John A., to United States of America, Army. Offset beacon homing. 4,179,088, Cl. 244-3.190.

Freudenschuss, Otto; Keznicki, Eduard; and Patels, Gottfried, to Vockenhuber, Karl; and Hauser, Raimund. Adjusting mechanism for optical objective with lost-motion zone. 4,179,191, Cl. 350-187.000.

Freudenschuss, Otto; and Kittag, Gerd, to Vockenhuber, Karl; and Hauser, Raimund. Method and equipment for the production of multi-channel sound signal. 4,179,713, Cl. 360-27.000.

Friedman, Jerome D.; and Pitha, Carl A., to United States of America, Air Force. Wide band adjustable brewster angle polarizer. 4,179,190, Cl. 350-152.000.

Friedrichs, Carsten: *See*—
Hess, Dieter; Friedrichs, Carsten; and Daubenbuchel, Werner, 4,179,251, Cl. 425-140.000.

Fromfield, James P., to Automatic Switch Company. Valve member for pilot operated valves. 4,179,096, Cl. 251-38.000.

Fuhr, Karl: *See*—
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, 4,179,478, Cl. 525-113.000.

Fuhrman, Victoria L.: *See*—
McCourry, Phyllis J.; and Fuhrman, Victor. L., 4,178,947, Cl. 132-92.00R.

Fuji Photo Film Co., Ltd.: *See*—
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, 4,179,293, Cl. 430-551.000.
Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, 4,179,387, Cl. 252-62.560.
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.
Sugiyama, Masatoshi; and Kato, Eiichi, 4,179,294, Cl. 430-522.00A.

Takahashi, Isoji, 4,179,290, Cl. 430-34.000.
Fujinaga, Shigeki: *See—*
Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, 4,179,602, Cl. 219-125.100.
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, to Kuraray Co., Ltd. Substituted propargyl alcohols, allylic alcohols and unsaturated ketones, and methods for the production thereof. 4,179,579, Cl. 568-840.000.
Fujitsu Limited: *See—*
Kudo, Daiziro, 4,178,877, Cl. 118-728.000.
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, 4,179,326, Cl. 156-612.000.
Miura, Yoshimasa, 4,179,720, Cl. 360-113.000.
Fukuhara, Toru, to Nippon Kogaku K.K. Diaphragm aperture control device in a camera. 4,179,202, Cl. 354-43.000.
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, to Hitachi, Ltd. Variable impedance circuits. 4,179,650, Cl. 323-1.000.
Fukushima, Seiji: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.
Fuller, William A., to Colt Industries Operating Corp. Acceleration pump with temperature-responsive control of delivery. 4,179,245, Cl. 417-292.000.
Funderburg, William S. Electromagnetic motor. 4,179,631, Cl. 310-20.000.
Furuitsu, Satoshi: *See—*
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,617, Cl. 250-531.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,618, Cl. 250-531.000.
Furukawa Electric Co., Ltd., The: *See—*
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.
G. B. R., Ltd.: *See—*
Gunther, William H., Jr.; Golicz, Roman M.; and Hough, James W., 4,179,111, Cl. 270-68.00R.
G. D. Searle & Co.: *See—*
Forman, Hugh M., 4,178,934, Cl. 128-295.000.
G. Leblanc Corporation: *See—*
Ramirez, Lawrence V., 4,178,830, Cl. 84-388.000.
Gabel, Robert K.; Lindenberger, William H.; and Pavilcius, Audrone M., to Nalco Chemical Company. Single addition organic-inorganic blend emulsion breaking composition. 4,179,396, Cl. 252-329.000.
Gadaev, Anatoly Y.: *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.
GAF Corporation: *See—*
Chakrabarti, Paritosh M., 4,179,331, Cl. 162-156.000.
Galey, Jean: *See—*
Gilbert, Ghislain; Galey, Jean; and Bentz, Gerard, 4,178,980, Cl. 164-66.000.
Gallimore, Claris C., to F. D. Graphics, Inc. Apparatus for feeding leaflets to rapidly moving articles. 4,179,113, Cl. 271-12.000.
Gallina, Salvatore; and Davidson, Stan, to M. Morell Packaging Co., Inc. Control system for an electronic music synthesizer. 4,178,821, Cl. 84-1.010.
Ganapathy, Anantharam: *See—*
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,455, Cl. 260-409.000.
Shenoy, Raghuram D.; and Ganapathy, Anantharam, 4,179,456, Cl. 260-409.000.
Gandhi, Haren S.; Shelef, Mordecai; and Wynblatt, Paul P., to Ford Motor Company. Enriched rhodium catalyst and method for making same. 4,179,413, Cl. 252-472.000.
Ganley, Thomas. Rotary engine. 4,178,902, Cl. 123-231.000.
Gantevoort, Heinz L.: *See—*
Wardt, Volker; and Gantevoort, Heinz L., 4,179,262, Cl. 431-354.000.
Garcia, Felipe G., to Electric Power Research Institute, Inc. High voltage high current cable terminal with dual grading capacitor stack. 4,179,582, Cl. 174-15.0BH.
Gardikes, John J., to Ashland Oil, Inc. Phenolic resin-polyisocyanate binders. 4,179,427, Cl. 260-29.2TN.
Garner, Joseph L.; and Tiffany, Peter A., to Dow Chemical Company, The. Method for expanding microspheres and expandable composition. 4,179,546, Cl. 521-56.000.
Garnett, John L.; and Kenyon, Robert S. Preparation of heterogeneous catalysts including the steps of radiation grafting of an alpha unsaturated monomer to a metal or to an organic polymer. 4,179,401, Cl. 252-429.00R.
Garrison, C. Gene; and Southern, William, to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Mild detonating cord confinement. 4,178,853, Cl. 102-27.00R.
Gassner, Saul A.: *See—*
Allingham, Yael; Vofsi, David; and Gassner, Saul A., 4,179,547, Cl. 525-2.000.
Gebruder Lodige Maschinenbaugesellschaft mbH: *See—*
Lucke, Roland, 4,179,221, Cl. 366-309.000.
Geckeler, Siegfried, to Siemens Aktiengesellschaft. Gradient optical fiber. 4,179,188, Cl. 350-96.310.
Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M. Method and apparatus for disintegration of urinary concretions. 4,178,935, Cl. 128-328.000.
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., to United States of America, Navy. Electrically controllable wide angle of view optical notch filter. 4,179,194, Cl. 350-356.000.
Gellert, Robert I.: *See—*
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., 4,179,218, Cl. 356-336.000.
Gelsdorf, Gunter: *See—*
Jeschke, Peter; and Gelsdorf, Gunter, 4,179,046, Cl. 222-600.000.
General Binding Corporation: *See—*
Staats, Henry N.; Schmidt, Waldemar M.; and Davila, Efrain A., 4,179,325, Cl. 156-498.000.
General Dynamics Corporation, Pomona Division: *See—*
Schillreff, George H., 4,178,854, Cl. 102-89.0CD.
General Electric Company: *See—*
Cole, Herbert S., Jr.; and Aftergut, Siegfried, 4,179,395, Cl. 252-299.000.
Cook, James S., 4,179,619, Cl. 250-551.000.
Germer, Warren R., 4,179,654, Cl. 324-116.000.
Harris, Raymond W.; and Sherman, Ralph R., Jr., 4,179,661, Cl. 325-455.000.
Lange, Kai; and Jeppesen, Jorgen, 4,179,607, Cl. 250-363.00S.
Russell, Ronald R., 4,179,646, Cl. 318-380.000.
Schroeter, Siegfried H.; and Olson, Daniel R., 4,179,548, Cl. 525-329.000.
Slayton, Curtis R., 4,178,765, Cl. 62-83.000.
Smashey, Russell W., 4,178,986, Cl. 164-251.000.
General Electric Company Limited, The: *See—*
Britton, John, 4,179,641, Cl. 315-289.000.
General Motors Corporation: *See—*
Bremer, Richard J.; and Richardson, Daniel J., 4,178,793, Cl. 73-23.000.
Burke, Harold J., 4,179,137, Cl. 280-775.000.
Cummins, Donald L.; and Stahura, Daniel W., 4,179,647, Cl. 320-6.000.
Lura, Loren E.; and Zeigler, Philip B., 4,179,167, Cl. 308-189.00A.
Stevens, Eloy C.; and Swain, Kenneth, 4,178,667, Cl. 29-156.80B.
Gentran, Inc.: *See—*
Wuertele, James W., 4,179,745, Cl. 364-571.000.
George, Leroy. Pipe tool. 4,178,668, Cl. 29-237.000.
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., to DSO "Pharmachim". Derivatives of R,S-[X2-(2-hydroxyethylamino)-1-phenyl]-ethylamine, and process. 4,179,460, Cl. 260-455.00R.
Gerber Garment Technology,: *See—*
Gerber, Heinz J., 4,178,820, Cl. 83-13.000.
Gerber, Heinz J., to Gerber Garment Technology,. Method and apparatus for cutting sheet material with improved accuracy. 4,178,820, Cl. 83-13.000.
Gergonne, Pierre, to Etablissements Gergonne. Door stop with removable damping member. 4,178,658, Cl. 16-86.00A.
Gerkey, Kenneth S., to Westinghouse Electric Corp. Remotely operated tube expanding tool and support. 4,178,787, Cl. 72-122.000.
Germer, Warren R., to General Electric Company. Demand meter including means for selectively controlling the length of demand intervals. 4,179,654, Cl. 324-116.000.
Germond, Jean-Claude: *See—*
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, 4,179,035, Cl. 414-2.000.
Gesellschaft fur Schwerionenforschung mbH, Darmstadt: *See—*
Kraus, Hubert; and Strehl, Peter, 4,179,615, Cl. 250-489.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Breuer, Oswald; and Steinkuhl, Bernd, 4,179,161, Cl. 299-34.000.
Giacino, Christopher: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.
Gibson, John. Powered pipe wrench. 4,178,817, Cl. 81-57.130.
Gidai, Katalin: *See—*
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.
Giglberger, Dieter: *See—*
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.
Gilbert, Earl F., to Westvaco Corporation. Partitioned container. 4,179,061, Cl. 229-27.000.
Gilbert, Ghislain; Galey, Jean; and Bentz, Gerard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Protection of molten metal. 4,178,980, Cl. 164-66.000.
Gildersleeve, Hayden P., to Holly Sugar Corporation. Method and apparatus for operating rotary driers. 4,179,265, Cl. 432-36.000.
Gillette, Roger B.; and Woods, Weightstill W., to Boeing Company, The. Focusing reflector. 4,179,193, Cl. 350-295.000.
Giovanelli, Cesare, to Bottega Incisioni di Orizio-Giovanelli. Apparatus for, and a process of, sector engraving metal elements. 4,178,846, Cl. 101-5.000.
Gladrow, Elroy M.; and Wheelock, Kenneth S., to Exxon Research & Engineering Co. Hydrocarbon cracking catalyst. 4,179,409, Cl. 252-455.00Z.
Glaenzer Spicer: *See—*
Orain, Michel, 4,178,778, Cl. 64-21.000.

Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., to Burr-Brown Research Corporation. Modular hardware packaging apparatus. 4,179,172, Cl. 339-17.0LM.

Golicz, Roman M.: *See—*
Gunther, William H., Jr.; Golicz, Roman M.; and Hough, James W., 4,179,111, Cl. 270-68.00R.

Golinsky, Martin, to Grumman Aerospace Corporation. Passive ranging method. 4,179,697, Cl. 343-112.00D.

Goloff, Alexander, to Caterpillar Tractor Co. Rotary engine housing manufacture. 4,178,725, Cl. 51-290.000.

Gonzalez, Joseph L.: *See—*
Felice, Patrick E.; Gonzalez, Joseph L.; and Seidel, John G., 4,179,614, Cl. 250-253.000.

Goodhue, Charles T.: *See—*
Esders, Theodore W.; Goodhue, Charles T.; and Michrina, Christine A., 4,179,334, Cl. 195-30.000.

Goodman, Vernon T. Three dimensional chess game apparatus. 4,179,127, Cl. 273-241.000.

Goodrich, Joel L.: *See—*
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,179,318, Cl. 148-187.000.

Goodwin, Robert A.: *See—*
Finnemore, Fred M.; and Goodwin, Robert A., 4,179,205, Cl. 354-145.000.

Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., to Reynolds Metals Company. Solar collector. 4,178,909, Cl. 126-417.000.

Gordon, Maurice R. Microbiological medium suitable for sterilization by ionizing radiation. 4,179,338, Cl. 435-243.000.

Goren, Robert N., to Xerox Corporation. Multicolor line screen. 4,179,209, Cl. 355-3.00P.

Gorlitz, Frank-Otto: *See—*
Schnellbacher, Kurt; Muller, Klaus; and Gorlitz, Frank-Otto, 4,179,363, Cl. 209-481.000.

Gotoh, Miyuki; and Ogawa, Mikiyoshi, to Nissan Motor Company, Limited. System and method for controlling the stopping operations of weaving machines. 4,178,969, Cl. 139-1.00R.

Gougoulas, Harry K. Dryer curtain for car wash. 4,178,648, Cl. 15-97.00B.

Gould Inc.: *See—*
Kozacka, Frederick J.; and Perreault, Richard J., 4,179,677, Cl. 337-161.000.
Perkins, Norman P., Jr., 4,179,675, Cl. 335-9.000.
Perreault, Richard, 4,179,678, Cl. 337-293.000.

Graf, Norman G.: *See—*
Ford, Alan T.; and Graf, Norman G., 4,178,709, Cl. 40-471.000.

Gramer, Eben J.; and Johnson, Melvin O. Solar collector and system for mounting a plurality of solar collectors on a surface. 4,178,910, Cl. 126-442.000.

Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, to Laboratorios Made, S.A. 2,5-Dimethyl-benzo[b]-thieno[2,3-f]morphan and precursors thereof. 4,179,565, Cl. 546-63.000.

Graves, Daniel F.: *See—*
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., 4,179,555, Cl. 528-168.000.

Green, George E., to Ciba-Geigy Corporation. Polymerisable esters derived from a phenolic unsaturated ketone. 4,179,577, Cl. 560-52.000.

Green, Howard E.: *See—*
Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., 4,179,551, Cl. 526-262.000.

Greenbaum, George. Channel culture array using saline water. 4,178,715, Cl. 47-58.000.

Greenslade, John T.: *See—*
Hayes, James L.; and Greenslade, John T., 4,179,030, Cl. 206-396.000.

Greenwood, Wade H.: *See—*
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,179,322, Cl. 156-192.000.

Greer Hydraulics, Inc.: *See—*
Zahid, Abduz, 4,178,965, Cl. 138-30.000.

Gregorian, Roubik, to American Microsystems, Inc. Switched capacitor elliptic filter. 4,179,665, Cl. 330-107.000.

Gresser, Gerhard: *See—*
Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, 4,178,876, Cl. 118-681.000.

Griesshammer, Rudolf: *See—*
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,179,530, Cl. 427-51.000.

Griffith, Gary L.: *See—*
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,179,322, Cl. 156-192.000.

Griffiths, David W.: *See—*
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,179,549, Cl. 525-374.000.

Grigoriev, Valentin I.: *See—*
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.

Grim, Wayne M.: *See—*
Cohen, Edward M.; Grim, Wayne M.; Harwood, Richard J.; and Mehta, Gunvant N., 4,179,497, Cl. 424-22.000.

Grimm, Harold; and Zuckerman, Ira, to Panther Machine Corp. Supplemental feed assembly for sheet material spreading machine. 4,179,108, Cl. 270-31.000.

Grivsky, Eugene M., to Burroughs Wellcome Co. Biologically active amide. 4,179,524, Cl. 424-324.000.

Grochowski, Horst: *See—*
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

Grocke, Diethelm W. K.; and Wittmann, Klaus, to NUTRO Patentverwertungs- und Maschinenhandels-GmbH. Installation for the production of a multiple row cask of containers. 4,179,022, Cl. 198-437.000.

Groner, Norman A., to Victor United, Inc. Compound bow adjustment and indicating mechanism. 4,178,905, Cl. 124-23.00R.

Groom, James S.; and Prince, Clarence F., to Package Machinery Company. Wrapping machine. 4,178,740, Cl. 53-556.000.

Groth, Hugh F.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.

Grumman Aerospace Corporation: *See—*
Golinsky, Martin, 4,179,697, Cl. 343-112.00D.
Montusi, Robert R., 4,179,273, Cl. 55-457.000.

Grundei, Hans; and Thomas, Wolfram, to Schutt and Grundei O.H.G. Knee-joint-endoprothese. 4,178,641, Cl. 3-1.911.

GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
Opelt, Christian, 4,179,712, Cl. 360-14.000.

Gryaznov, Vladimir M.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

GTE Sylvania Incorporated: *See—*
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., 4,179,297, Cl. 106-1.120.
Buljan, Sergej-Tomislav, 4,179,301, Cl. 106-73.500.
Jayne, Max L., 4,179,176, Cl. 339-74.00R.
Lapraik, Scott J., 4,179,177, Cl. 339-74.00R.

Guenther, Heinz R.: *See—*
Feldman, Edward; and Guenther, Heinz R., 4,179,224, Cl. 400-637.000.

Gulf Research and Development Company: *See—*
Beuther, Harold; and Swift, Harold E., 4,179,474, Cl. 585-251.000.
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,179,354, Cl. 208-89.000.
Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., 4,179,355, Cl. 208-89.000.
Mann, James T., 4,179,384, Cl. 252-32.70E.
Mann, James T., 4,179,389, Cl. 252-32.70E.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,179,358, Cl. 208-114.000.

Gunther, William H., Jr.; Golicz, Roman M.; and Hough, James W., to G. B. R., Ltd. Folding mechanism. 4,179,111, Cl. 270-68.00R.

Guthrie, David B.: *See—*
Cheng, William J.; and Guthrie, David B., 4,179,383, Cl. 252-25.000.

Gutman, Arnold D., to Stauffer Chemical Company. Certain cyanodithioimidocarbonates for controlling bacteria and fungi. 4,179,523, Cl. 424-324.000.

Guttmann, Emil J., to Cole-Parmer Instrument Company. Quick loading peristaltic pump. 4,179,249, Cl. 417-477.000.

H. K. Porter, Inc.: *See—*
Sadauskas, Joseph J., 4,178,682, Cl. 30-250.000.

Haberhauer, Helmuth, to Hoechst Aktiengesellschaft. Device for fusing toner on a carrier of electrostatic images. 4,179,600, Cl. 219-216.000.

Hacker, Hermann; and Zehenthofer, Waldemar, to Vereinigte Oesterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Apparatus for distributing solids in granular or lump form. 4,179,023, Cl. 198-631.000.

Hadden, Terence B. Drill guide. 4,179,231, Cl. 408-112.000.

Hage, Charles T., to Eastman Kodak Company. Recirculating document feeder. 4,179,215, Cl. 355-50.000.

Hagy, Henry E.: *See—*
Boyd, David C.; Hagy, Henry E.; and Thompson, David A., 4,179,638, Cl. 313-480.000.

Hailey, Laurence N.: *See—*
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,179,299, Cl. 106-44.000.

Hakansson, Lars A. H. Device for purification of liquids. 4,179,376, Cl. 210-208.000.

Halasa, Adel F.: *See—*
Hergenrother, William L.; and Halasa, Adel F., 4,179,553, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,179,554, Cl. 528-168.000.
Hergenrother, William L.; and Halasa, Adel F., 4,179,556, Cl. 528-168.000.

Hale, Alan D., to Du Pont de Nemours, E. I., and Company. Melt cutter apparatus. 4,179,255, Cl. 425-67.000.

Halfter, Georg: *See—*
Franz, Gerhard; Halfter, Georg; Jaeckle, Walter; and Mindermann, Fritz, 4,179,476, Cl. 260-706.000.

Hall, Lawrence G., to Perkin-Elmer Corporation, The. Flowmeter for providing synchronized flow data and respiratory gas samples to a medical mass spectrometer. 4,178,919, Cl. 128-719.000.

Halliburton Company: *See—*
Farris, Richard C.; and Butler, William S., 4,178,959, Cl. 137-493.300.
Streich, Steven G., 4,178,967, Cl. 138-89.000.

Hallock, Edward C.; Olsen, Robert; and Ennesser, George, to Construction Specialties, Inc. Modular grille. 4,178,738, Cl. 52-663.000.

Ham, John K.: *See—*
Khan, Sultan W.; Ham, John K.; and Strissel, Richard A., 4,179,732, Cl. 364-200.000.

Hamada, Masa: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.

Hammann, Ingeborg: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Hamprecht, Gerhard: *See—*
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,179,465, Cl. 260-544.00C.

Hamster, Helmut: *See—*
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,179,530, Cl. 427-51.000.

Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, to Mitsui Toatsu Chemicals Incorporated. Laminates prepared from resol-type phenol resins. 4,179,429, Cl. 260-32.80R.

Hanaway, Roger D., to Allis-Chalmers Corporation. Tailings return for an axial flow combine. 4,178,944, Cl. 130-27.00R.

Hance, Richard J.; and Wiese, John R., to Leeds & Northrup Company. Means for assembling expendable immersion thermocouples. 4,179,309, Cl. 136-234.000.

Hancor, Inc.: *See—*
Child, James L., Jr.; Fouss, James L.; and Nowicki, Erwin K., 4,179,227, Cl. 405-182.000.

Hanna, Bobby W. Safety electrical receptacle and plug therefor. 4,179,180, Cl. 339-189.00R.

Hans Sickinger Co.: *See—*
Pfaffle, Ernst, 4,178,972, Cl. 140-105.000.

Hans, Waldemar: *See—*
Knapp, Heinrich; and Hans, Waldemar, 4,179,069, Cl. 239-125.000.

Hansen, Elmer K. Reversible tool mounting bracket for agricultural implements. 4,178,999, Cl. 172-702.000.

Hanses, Ulf. Knife and support element therefor. 4,178,681, Cl. 30-151.000.

Hanzawa, Hisashi; and Yoshino, Kozi, to Sony Corporation. Mode change-over device for recording and/or reproducing apparatus. 4,178,809, Cl. 74-483.0PB.

Hara, Kunio; and Yoshida, Kohsaku, to Nichi-Ei Bussan Co., Ltd. Method for continuously fixing a plurality of tubular fasteners one by one to a plurality of apertures provided in a support panel. 4,178,669, Cl. 29-412.000.

Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, to Furukawa Electric Co., Ltd., The; and Sumitomo Electric Industries, Ltd. Wire forcing device for a wire take up apparatus. 4,179,083, Cl. 242-158.00R.

Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, to Nippon Jiryoku Senko Co., Ltd. Process for treating molten steel slag with red mud from aluminum industry. 4,179,279, Cl. 75-24.000.

Harbin, High: *See—*
Courshon, Jacob B., Jr., 4,179,241, Cl. 416-137.000.

Hargraves Aerobic Systems, Inc.: *See—*
Marple, Elwood, 4,179,244, Cl. 417-273.000.

Harper, Douglas C.; and Attenburrow, Derek C., to Fisons Limited. Nutrient film technique. 4,178,716, Cl. 147-62.000.

Harris, Jerome R., to Amprint Corp. Printing and collating method. 4,179,107, Cl. 270-4.000.

Harris, Jerome R., to Amprint Corp. Collating equipment including collator and cart. 4,179,109, Cl. 270-52.000.

Harris, Raymond W.; and Sherman, Ralph R., Jr., to General Electric Company. Circuit for programming the search circuit of a radio receiver. 4,179,661, Cl. 325-455.000.

Harsco Corporation: *See—*
Bruno, Anthony T., 4,178,724, Cl. 51-178.000.
Burnham, Peter B., 4,178,978, Cl. 160-321.000.

Hartleben, York: *See—*
Kollensperger, Friedrich-Gero; Hartleben, York; Kretzschmar, Rolf; and Neteler, Bernhard, 4,179,442, Cl. 548-232.000.

Harvell, Don L., to Singer Company, The. Spindle locking mechanism for a rotary power device. 4,179,632, Cl. 310-50.000.

Harwood, Richard J.: *See—*
Cohen, Edward M.; Grim, Wayne M.; Harwood, Richard J.; and Mehta, Gunvant N., 4,179,497, Cl. 424-22.000.

Hasebe, Toshiharu: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.

Hashimoto, Hiroshi, to Nippon Kogaku K. K. Device for fabricating axially symmetric aspherics. 4,178,720, Cl. 51-124.00L.

Haskell, Donald M.: *See—*
Makovec, Donald J.; and Haskell, Donald M., 4,179,475, Cl. 585-714.000.

Hasler AG: *See—*
Bartschi, Jean-Jacques, 4,179,701, Cl. 346-62.000.

Hatanaka, Minoru: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,179,557, Cl. 544-28.000.

Hattori, Hiroyuki: *See—*
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, 4,179,116, Cl. 271-306.000.

Hattori, Masao: *See—*
Nishikawa, Masanori; and Hattori, Masao, 4,179,488, Cl. 264-521.000.

Hauser, Raimund: *See—*
Freudenschuss, Otto; Keznickl, Eduard; and Patels, Gottfried, 4,179,191, Cl. 350-187.000.
Freudenschuss, Otto; and Kittag, Gerd, 4,179,713, Cl. 360-27.000.

Hawk, Robert M., to Corning Glass Works. Coupler for optical communication system. 4,179,185, Cl. 350-96.160.

Hawkins, Roland L., to Hoechst Fibers Industries, Division of American Hoechst Corporation. Staple fiber, finish therefor and process for use of same. 4,179,543, Cl. 428-361.000.

Hawton, John T., Jr.; and Shumate, William G., to Hewlett-Packard Company. Cylindrical magnetron sputtering source. 4,179,351, Cl. 204-298.000.

Hayashi, Asao: *See—*
Suzuki, Takeomi; and Hayashi, Asao, 4,179,743, Cl. 364-518.000.

Hayes, James L.; and Greenslade, John T., to Eltra Corporation. Unitary foldable dispenser reel and container with removable dispenser portion. 4,179,030, Cl. 206-396.000.

Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Hydrocarbon conversion with an acidic multimetallic catalytic composite. 4,179,359, Cl. 208-139.000.

Hayes, Robert R., to Oatey Co. Hand scraper. 4,178,663, Cl. 29-78.000.

Heberle, Heinz, to Rigert Maschinenbau AG. Stairway-type passenger lift. 4,179,012, Cl. 187-12.000.

Heesen, Theodorus J. Press. 4,179,257, Cl. 425-331.000.

Heiba, El-Ahmadi I.; and Williams, Albert L., to Mobil Oil Corporation. Biodegradable hard water detergents. 4,179,392, Cl. 252-108.000.

Heide, Helmut: *See—*
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.

Heider, Joachim: *See—*
Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, 4,179,508, Cl. 424-258.000.

Hein, Paul R.; and Irvin, Robert A., to W. R. Grace & Co. Polythiol effect, curable monoalkenyl aromatic-diene and ene composition. 4,179,531, Cl. 430-300.000.

Heine, Arnold J.: *See—*
Skinner, Robert I.; and Heine, Arnold J., 4,179,104, Cl. 267-154.000.

Heinrich Baumgarten,Eisen- und Blechenwaren Fabrik: *See—*
Fischbach, Wolfgang, 4,179,146, Cl. 294-27.00H.

Heise, Arend: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Heist, Marshall S.: *See—*
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.

Heitzer, Helmut: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Helfer, Joel N.: *See—*
Bratten, William R.; and Helfer, Joel N., 4,179,364, Cl. 210-321.00B.

Helmig, Richard W. Method and apparatus for offset printing employing fluoroelastomers. 4,178,850, Cl. 101-451.000.

Henderson, Donald L. Removable cover and holder therefor. 4,179,144, Cl. 292-202.000.

Hendricks, Fred; and Draper, Cassius W. Bowling ball kicker pressure device. 4,179,120, Cl. 273-49.000.

Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Kaufmann, Jochen; Berg, Markus; and Krings, Peter, 4,179,391, Cl. 252-99.000.
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Henneberg, Helmut: *See—*
Daniels, George R.; and Henneberg, Helmut, 4,179,169, Cl. 312-257.00R.

Henschen, Lawrence J. Computerized unit organ relay. 4,178,828, Cl. 84-337.000.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing cyclic ketal substituents. 4,179,553, Cl. 528-168.000.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene copolymers containing dialkyl aminoxy substituents. 4,179,554, Cl. 528-168.000.

Hergenrother, William L.; and Halasa, Adel F., to Firestone Tire & Rubber Company, The. Polyphosphazene polymers containing substituents derived from ketoximes. 4,179,556, Cl. 528-168.000.

Heritage Quilts Inc.: *See—*
Wrightson, John C., 4,178,637, Cl. 2-69.500.

Hermann Rossler: *See—*
Krumeich, Jorg; and Rossler, Hermann, 4,179,195, Cl. 351-4.000.

Herrenschmidt, Gilles R. Variable ratio full range direct-reflected pyramid inclined loudspeaker. 4,179,585, Cl. 179-1.00E.

Herschtal, Ludwik, to L. M. Ericsson Pty. Ltd. Bit switching of word formatted data. 4,179,587, Cl. 179-15.0AT.

Herth, Harro, to Robert Bosch GmbH. Method and apparatus for fuel/air mixture adjustment. 4,178,883, Cl. 123-32.0EE.

Herzog, James L.: *See—*
Kouse, Charles H.; and Herzog, James L., 4,178,649, Cl. 15-104.06R.

Hesler, Dietrich: *See—*
Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, 4,178,876, Cl. 118-681.000.

Hess, Dieter; Friedrichs, Carsten; and Daubenbuchel, Werner, to Kautex-Werke Reinold Hagen GmbH. Multiple extrusion head extrusion blow moulding apparatus. 4,179,251, Cl. 425-140.000.

Heusler, Helmut; and Behle, Fritz, to O&K Orenstein & Koppel Aktiengesellschaft. Transporter for the transportation of pieces of baggage integrated with an escalator. 4,179,020, Cl. 198-326.000.

Hewlett-Packard Company: *See—*
Hawton, John T., Jr.; and Shumate, William G., 4,179,351, Cl. 204-298.000.
Pirkle, Sherman J., 4,179,728, Cl. 363-59.000.

Heybey, Otfried W. G., to Whirlpool Corporation. Temperature sensor. 4,179,680, Cl. 338-25.000.

Higuchi, Kenichi. Fishing rod made of fiber reinforced synthetic resin. 4,178,713, Cl. 43-18.0GF.

Hildebrand, B. Percy; and Posakony, Gerald J., to Electric Power Research Institute, Inc. Method and apparatus for energizing an array of acoustic transducers to eliminate grating lobes. 4,179,683, Cl. 367-138.000.

Hildebrand, Donald L.: *See—*
Wolynec, John J.; Hildebrand, Donald L.; and Wasynczuk, Victor, 4,178,647, Cl. 15-84.000.

Hilfman, Lee: *See—*
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,179,356, Cl. 208-111.000.

Hines, Charles E.; and Williams, Dwight E., to Outboard Marine Corporation. Soil treatment liquid injection device. 4,178,860, Cl. 111-7.000.

Hines, William W.: *See—*
Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., 4,179,170, Cl. 339-14.00R.

Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,179,293, Cl. 430-551.000.

Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, to Canon Kabushiki Kaisha. Camera equipped with data recording device. 4,179,203, Cl. 354-106.000.

Hirsch, Irving A., to Boeing Company, The. Automatic control system for hydrofoil craft. 4,178,871, Cl. 114-275.000.

Hirt, Paul R. Adjustable post-surgical shoe. 4,178,925, Cl. 128-83.500.

Hisajima, Masahiko: *See—*
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.

Hitachi, Ltd.: *See—*
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, 4,179,650, Cl. 323-1.000.
Kotoyori, Akira, 4,179,200, Cl. 354-1.000.
Muto, Nobuyoshi; Matsuda, Yasuo; and Honda, Kazuo, 4,179,727, Cl. 363-41.000.
Ogiwara, Kenzyu; Inoue, Hisao; and Naganuma, Susumu, 4,179,237, Cl. 415-1.000.
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,179,412, Cl. 252-472.000.

Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, to Nippon Gakki Seizo Kabushiki Kaisha. Envelope generator. 4,178,826, Cl. 84-1.260.

Hobbs, Charles F., to United States of America, Air Force. Anti-jamming communication system. 4,179,657, Cl. 325-33.000.

Hockiki Corporation: *See—*
Adachi, Akio, 4,179,751, Cl. 365-228.000.

Hodgson, Eric C.: *See—*
Alderman, William; and Hodgson, Eric C., 4,179,016, Cl. 192-4.00A.

Hoechst Aktiengesellschaft: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,178,705, Cl. 38-144.000.
Haberhauer, Helmuth, 4,179,600, Cl. 219-216.000.
Klupfel, Kurt-Walter; and Sprengel, Heide, 4,179,292, Cl. 430-175.000.

Hoechst Fibers Industries, Division of American Hoechst Corporation: *See—*
Hawkins, Roland L., 4,179,543, Cl. 428-361.000.

Hoeft, Karl: *See—*
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.

Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold R., to E. R. Squibb & Sons, Inc. 1,5,6,11-Tetrahydro[5,6]cyclohepta[1,2-b]pyrazolo[4,3-e]pyridine derivatives. 4,179,564, Cl. 546-64.000.

Hoesch Werke Aktiengesellschaft: *See—*
Schultz, Helmut, 4,178,692, Cl. 33-182.000.

Hoffman, Robert E.; Williams, Richard B.; and Wright, Carl J., to White Consolidated Industries, Inc. Dishwasher fill system. 4,178,957, Cl. 137-387.000.

Hoffmann-La Roche Inc.: *See—*
Berger, Leo; and Scott, John W., 4,179,443, Cl. 260-315.000.

Hollenbeck, William: *See—*
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.

Holly Sugar Corporation: *See—*
Gildersleeve, Hayden P., 4,179,265, Cl. 432-36.000.

Holma, Gary M.: *See—*
Forman, Donald B.; and Holma, Gary M., 4,178,722, Cl. 51-170.00T.

Holmstrom, Paul E., to Warner & Swasey Company, The. Machine tool having deflection compensation for tool support arm. 4,178,834, Cl. 409-80.00C.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, 4,178,890, Cl. 123-103.00R.

Honda, Kazuo: *See—*
Muto, Nobuyoshi; Matsuda, Yasuo; and Honda, Kazuo, 4,179,727, Cl. 363-41.000.

Honeywell Information Systems Inc.: *See—*
Daniels, George R.; and Henneberg, Helmut, 4,179,169, Cl. 312-257.00R.
Wilhite, John E., 4,179,736, Cl. 364-200.000.

Honeywell Ltd.: *See—*
Jacobsen, William F., 4,179,623, Cl. 250-573.000.

Honig, Dietmar: *See—*
Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, 4,179,289, Cl. 75-206.000.

Honig, Helmut: *See—*
Pampouchidis, Georgios; and Honig, Helmut, 4,179,425, Cl. 260-29.6NR.

Honnold, Fred V.: *See—*
Cann, Peter L.; Karns, Phil J.; and Honnold, Fred V., 4,178,988, Cl. 165-2.000.

Hood, John D.: *See—*
Box, Stephen J.; and Hood, John D., 4,179,498, Cl. 424-117.000.

Hoover Company, The: *See—*
Tschudy, Donald B., 4,178,653, Cl. 15-383.000.

Hori, Kenji: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recyc'...g system. 4,178,896, Cl. 123-119.00A.

Hoseney, Russell C.: *See—*
Sieb, Paul A.; Deyoe, Charles W.; and Hoseney, Russell C., 4,179,445, Cl. 260-340.90R.

Hosogai, Takeo: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Hough, James W.: *See—*
Gunther, William H., Jr.; Golicz, Roman M.; and Hough, James W., 4,179,111, Cl. 270-68.00R.

Houghland, Stephen E., to Minnesota Mining and Manufacturing Company. Thermal switch. 4,179,679, Cl. 337-407.000.

Hourihan, Glyn: *See—*
Davies, Michael; Hourihan, Glyn; and Smith, Frank, 4,179,653, Cl. 324-65.0CR.

Howe, Arthur T.; and Shilton, Mark G., to National Research Development Corporation. Electrical device with separator as conductor for hydrogen cations. 4,179,491, Cl. 423-253.000.

Howe, Robert R. Wind operated power generating apparatus. 4,179,007, Cl. 180-65.0DD.

Hoya Corporation: *See—*
Sagara, Hiroji, 4,179,300, Cl. 106-47.00Q.

Hoyle, George W.: *See—*
Godsey, Ernest E.; Hoyle, George W.; and Christensen, Rusty S., 4,179,172, Cl. 339-17.0LM.

Hozumi, Shiro: *See—*
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.

Hruza, Anne: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.

Hsieh, Henry L., to Phillips Petroleum Company. Blends of cyclodiene-containing copolymers and block copolymers having improved high temperature green tensile strength. 4,179,480, Cl. 525-99.000.

Hubert, Francois M. A.: *See—*
Piette, Remi R.; and Hubert, Francois M. A., 4,179,025, Cl. 198-833.000.

Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, to Chemische Fabrik Stockhause & Cie. Flocculating agent comprising water-in-oil emulsion of stabilizer plus NH-active polymer carrying formaldehyde and amine radicals. 4,179,370, Cl. 210-51.000.

Hueil, J. Charles: *See—*
Becht, Carl T.; and Hueil, J. Charles, 4,179,057, Cl. 227-19.000.

Hughes, Charles C., to R. A. Jones & Co. Inc. Carton erecting apparatus. 4,178,839, Cl. 93-53.0SD.

Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Monoazodyestuffs containing diphenamine and phenoxy components. 4,179,436, Cl. 260-206.000.

Huisman, Marinus, to Volkswagenwerk Aktiengesellschaft. Vehicle sun roof cover. 4,179,156, Cl. 296-137.00B.

Huitson, John J., to BP Chemicals Limited. Certain complex salts of mono carboxylic acids used as preservatives. 4,179,522, Cl. 424-317.000.

Humber, Leslie G.: *See—*
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.

Hunt, Guilbert M.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.

Hunt, Roger A., to ICN Medical Laboratories, Inc. Platelet control composition. 4,179,398, Cl. 252-408.000.

Huppertz, Josef: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Hurlock, John R.: *See—*
Phillips, Kenneth G.; Ballweber, Edward G.; and Hurlock, John R., 4,179,424, Cl. 260-29.4UA.

Husky Injection Molding Systems Inc.: *See—*
Brown, Paul, 4,179,254, Cl. 425-438.000.

Huss, Charles P., to Minnesota Mining and Manufacturing Company. Apparatus and method for releasably securing sheet material to the drum of a drum-type facsimile machine. 4,179,118, Cl. 271-277.000.

Hutchison, J. A., to Solar Kinetics, Inc. Solar collector system. 4,178,913, Cl. 126-424.000.

Hutni project Praha, projekcni a inzenyrska: *See—*
Limberg, Jaroslav; Limberg, Tomas; and Rayman, Vaclav, 4,179,340, Cl. 202-262.000.

Hutson, Thomas, Jr.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Conversion of low octane number alkylate to high octane gasoline and aromatics. 4,179,353, Cl. 208-65.000.

Hydragon Corporation, The: *See—*
Earnest, Ernest R., 4,178,754, Cl. 60-39.030.

Ichikawa, Singo: *See—*
Murakami, Tomomi; and Ichikawa, Singo, 4,178,750, Cl. 58-4.00A.

ICN Medical Laboratories, Inc.: *See—*
Hunt, Roger A., 4,179,398, Cl. 252-408.000.

Iida, Kazumi, to Yamaha Hatsudoki Kabushiki Kaisha. Intake distributor for two-cycle internal combustion engines. 4,178,887, Cl. 123-73.00V.

Iijima, Yukihiko: *See—*
Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, 4,179,710, Cl. 358-135.000.

Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, to Ricoh Co., Ltd. Catalyst bed for use in decomposition of ammonia gas. 4,179,407, Cl. 252-446.000.

Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, to Sumitomo Electric Industries Ltd. Method and apparatus for displacing oil and seawater in tanks of an oil tank. 4,178,868, Cl. 114-74.00R.

Ilmoniemi, Erkki; and Kokkonen, Olavi, to Valmet Oy. Apparatus for damping pressure and consistency perturbations in a pulp suspension flow. 4,179,332, Cl. 162-380.000.

Imai, Tamotsu, to UOP Inc. Preparation of amines. 4,179,469, Cl. 260-577.000.

Imamura, Kazuo: *See—*
Miyake, Tetsuya; Noguchi, Kohji; and Imamura, Kazuo, 4,179,576, Cl. 546-251.000.

Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, to Kokusai Denshin Denwa Kabushiki Kaisha. Thin film magnetic head. 4,179,719, Cl. 360-112.000.

IMC Magnetics Corporation: *See—*
Conrad, Coleman W.; and Fenska, Edward W., 4,179,150, Cl. 294-83.00R.

Imperial Chemical Industries Limited: *See—*
Davies, Michael; Hourihan, Glyn; and Smith, Frank, 4,179,653, Cl. 324-65.0CR.

Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, to Hitachi Shipbuilding & Engineering Co., Ltd. Process for producing catalyst precursors for decomposing ammonia by oxidation and precursors produced by said process. 4,179,412, Cl. 252-472.000.

Inaba, Shigeho: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.

Inaga, Hisashi, to Kioritz Corporation. Chain saw. 4,178,685, Cl. 30-381.000.

Inazumi, Chikashi: *See—*
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,179,412, Cl. 252-472.000.

Inderbitzen, Emil R.: *See—*
Jugle, Lawrence C.; Inderbitzen, Emil R.; and McDaniel, Paul W., 4,178,794, Cl. 73-28.000.

Industrial Filter & Pump Mfg. Co.: *See—*
Borre, Earl A., 4,179,378, Cl. 210-232.000.
Borre, Earl A., 4,179,378, Cl. 210-232.000.

Industrie Pirelli S.p.A.: *See—*
Angioletti, Attilio, 4,178,968, Cl. 138-126.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Lodi, Franco, 4,179,735, Cl. 364-200.000.

Ingram, Charles E., to Four Star Corporation. Air velocity responsive deflector. 4,179,154, Cl. 296-91.000.

Inoue, Hisao: *See—*
Ogiwara, Kenzyu; Inoue, Hisao; and Naganuma, Susumu, 4,179,237, Cl. 415-1.000.

Inoue, Yoshio: *See—*
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, 4,179,295, Cl. 428-447.000.

Institut de Recherches de la Siderurgie Francaise: *See—*
Birat, Jean-Pierre; and Ventavoli, Roger, 4,178,979, Cl. 164-49.000.

Institut vysokikh temperatur Akademii Nauk SSSR: *See—*
Antonov, Boris M.; Vasiliev, Viktor V.; and Pischikov, Sergei I., 4,179,730, Cl. 364-105.000.

Intel Corporation: *See—*
Liu, Sheau-Ming S.; Owen, William H., III; and Pashley, Richard D., 4,178,674, Cl. 29-571.000.

International Business Machines Corporation: *See—*
Fairchild, Peter T.; and Leininger, Joel C., 4,179,738, Cl. 364-200.000.
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,179,312, Cl. 148-1.500.
Moritz, Holger, 4,179,622, Cl. 250-571.000.
Queener, Carl A., 4,179,213, Cl. 355-14.00R.
Rhodes, John H., Jr., 4,179,117, Cl. 271-251.000.

International Flavors & Fragrances Inc.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.

International Telephone and Telegraph Corporation: *See—*
Levine, Arnold M.; and Waddoups, Ray O., 4,179,695, Cl. 343-6.50R.
Wallace, Charles H., 4,179,021, Cl. 198-341.000.

Intertrac Viehmann & Co., Firma: *See—*
Fass, Carl; and Brunn, Hansjoachim, 4,179,130, Cl. 277-84.000.

Intreprinderea de Antibiotice Iasi: *See—*
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.

Ippolito, Anthony L.: *See—*
Vartanian, Paul F.; and Ippolito, Anthony L., 4,179,271, Cl. 44-62.000.

Irani, Cyrus A.; Kasegrande, Stephen S.; McHugh, Daniel J.; and Leder, Frederic. Process for aromatics extraction from a 300°–430° F. boiling range naphtha. 4,179,362, Cl. 208-321.000.

Irvin, Robert A.: *See—*
Hein, Paul R.; and Irvin, Robert A., 4,179,531, Cl. 430-300.000.

Isaac, L. Henry; Nowak, Edward J.; and Schmitz, Charles R., to Display Corporation International. Display device having a locking mechanism. 4,179,168, Cl. 312-125.000.

Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, to Nippon Electric Co., Ltd. Predictive encoder with a non-linear quantizing characteristic. 4,179,710, Cl. 358-135.000.

Ishii, Koji, to Ryobi Ltd. Automatic plate supplying device for use in an offset printing machine. 4,178,848, Cl. 101-142.000.

Ishikawa, Hidenobu: *See—*
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.

Ishikawa, Tatsuo, to Ube Industries. Apparatus for supplying inserts to the metal mold of injection molding machines. 4,178,984, Cl. 164-333.000.

Ishikawa, Youhei: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,179,673, Cl. 333-204.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Ito, Akira; and Matsui, Masao, 4,178,994, Cl. 169-52.000.

Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, to Osaka University, President of. Acylation of 7-aminocephalosporanic acids. 4,179,557, Cl. 544-28.000.

Ishimoto, Tasuku: *See—*
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.

Itani, Takashi: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.

ITI Limited: *See—*
Mougin, Georges L., 4,178,872, Cl. 115-72.000.

Ito, Akira; and Matsui, Masao, to Nissan Motor Company, Limited; and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Fire extinguishing system for warehouses. 4,178,994, Cl. 169-52.000.

Ito, Akitoshi: *See—*
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Ito, Sadayoshi: *See—*
Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, 4,178,756, Cl. 60-397.000.

Iura, Yukio: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.00C.

Iwamoto, Atsuo: *See—*
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.

J. E. Hanger & Company Limited: *See—*
May, Denis R. W., 4,178,642, Cl. 3-28.000.

J. M. Eltzroth & Associates, Inc.: *See—*
Miller, Russell C., 4,179,305, Cl. 106-292.000.

J. R. Short Milling Company: *See*—
Kleinschmidt, Albert W., 4,179,525, Cl. 426-19.000.

Jackson, Knute D., to Kendall Company, The. Method of sheathing catheter. 4,178,735, Cl. 53-473.000.

Jacobsen, William F., to Honeywell Ltd. Pulsed level sensor. 4,179,623, Cl. 250-573.000.

Jaeckle, Walter: *See*—
Franz, Gerhard; Halfter, Georg; Jaeckle, Walter; and Mindermann, Fritz, 4,179,476, Cl. 260-706.000.

Jager, Wilhelm: *See*—
Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, 4,178,677, Cl. 29-605.000.

Jakobi, Gunter: *See*—
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Jansen, Richard F.: *See*—
Birum, Gail H.; and Jansen, Richard F., 4,179,482, Cl. 260-941.000.
Birum, Gail H.; and Jansen, Richard F., 4,179,483, Cl. 260-941.000.

Janssen, Eduard J. P., to U.S. Philips Corporation. Electric incandescent lamp. 4,179,636, Cl. 313-274.000.

Janssen, Paul A. J.; and Van Daele, Georges H. P., to Janssen Pharmaceutica N.V. N-(4-piperidinyl)-N-phenylamides. 4,179,569, Cl. 546-223.000.

Janssen Pharmaceutica N.V.: *See*—
Janssen, Paul A. J.; and Van Daele, Georges H. P., 4,179,569, Cl. 546-223.000.
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.

Jaulmes, Eric, to Ateliers de la Motobecane S.A. Carburetor and crankcase arrangement in a single-cylinder two-stroke engine. 4,178,888, Cl. 123-73.00V.

Jayne, Max L., to GTE Sylvania Incorporated. Circuit board connector. 4,179,176, Cl. 339-74.00R.

Jendersee, Melvin H.: *See*—
Lonn, Dana R.; and Jendersee, Melvin H., 4,178,741, Cl. 56-7.000.

Jennings, Ralph L., to Economy Forms Corporation. Wall structure for a nuclear reactor containment housing. 4,178,729, Cl. 52-284.000.

Jeppesen, Jorgen: *See*—
Lange, Kai; and Jeppesen, Jorgen, 4,179,607, Cl. 250-363.00S.

Jepson, Stanley R.: *See*—
Chan, Edwin T.; and Jepson, Stanley R., 4,179,037, Cl. 220-2.30R.

Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Kivel, Bennett, 4,179,272, Cl. 55-1.000.

Jeschke, Peter; and Gelsdorf, Gunter, to Didier-Werke A.G. Refractory plate for slide closures of metallurgical vessels. 4,179,046, Cl. 222-600.000.

Jessup, James L.: *See*—
Buckley, James E.; Bartold, Mitchell E.; Heist, Marshall S.; and Jessup, James L., 4,178,790, Cl. 72-224.000.

Jessup, Wilbur F., to Cincinnati Milacron Inc. Centerless grinding machine. 4,178,719, Cl. 51-103.0TF.

Jet Press, Inc.: *See*—
Bogdanovic, George, 4,179,138, Cl. 281-15.00B.

Johanns, Heinz, to AGFA-Gevaert A.G. Process and an apparatus for loading a cassette with an endless roll. 4,179,079, Cl. 242-56.00R.

Johanson, John E., to Johanson Manufacturing Corporation. Sealed tunable capacitor. 4,179,722, Cl. 361-293.000.

Johanson Manufacturing Corporation: *See*—
Johanson, John E., 4,179,722, Cl. 361-293.000.

Johnsen, Clifford N., to Trane Company, The. System for producing refrigeration and a heated liquid and control therefor. 4,178,769, Cl. 62-180.000.

Johnson, James S., to Sperry Rand Corporation. Gyroscope rate range switching and control system. 4,179,087, Cl. 244-175.000.

Johnson & Johnson: *See*—
Bemmels, Cyrus W., 4,179,415, Cl. 260-4.00R.

Johnson, Melvin O.: *See*—
Gramer, Eben J.; and Johnson, Melvin O., 4,178,910, Cl. 126-442.000.

Johnson, Ralph E.: *See*—
Odermann, Charles R.; and Johnson, Ralph E., 4,178,865, Cl. 112-261.000.

Johnson, Robert J. Snap hook. 4,179,148, Cl. 294-78.00R.

Johnson, Russell W.: *See*—
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,179,356, Cl. 208-111.000.
O'Hara, Mark J.; and Johnson, Russell W., 4,179,357, Cl. 208-111.000.

Johnson, Steven J.: *See*—
Binstock, Morton H.; and Johnson, Steven J., 4,178,762, Cl. 60-667.000.
Stern, Louis P.; and Johnson, Steven J., 4,178,763, Cl. 60-667.000.
Stern, Louis P.; and Johnson, Steven J., 4,179,742, Cl. 364-494.000.

Johnson, Timothy E.: *See*—
Prusinski, Richard C.; and Johnson, Timothy E., 4,178,727, Cl. 52-173.00R.

Johnston, David B. R., to Merck & Co., Inc. Process for preparing 17β-carboxy-5-androsten-3-ones. 4,179,453, Cl. 260-397.100.

Jones, Aaron U., to Seneca Sawmill Company, Inc. Board separator. 4,179,236, Cl. 414-117.000.

Jones, Lewis O.: *See*—
Rahn, Arthur W.; Jones, Lewis O.; and Lu, Chin H., 4,179,388, Cl. 430-108.000.

Jones, Mark A.: *See*—
Foreman, Brian E.; and Jones, Mark A., 4,179,371, Cl. 210-63.00R.

Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., to TRW, Inc. Low temperature curable compliant bismaleimide compositions. 4,179,551, Cl. 526-262.000.

Jones, Tod A. Fish egg planting method. 4,178,878, Cl. 119-3.000.

Jones, Trevor E., to Albright & Wilson Limited. Process for preparing organotin compounds. 4,179,458, Cl. 260-429.700.

Joosten, Joannes J. W. M.: *See*—
Breuers, Theo P. C.; and Joosten, Joannes J. W. M., 4,179,112, Cl. 271-3.000.

Jorgensen, George N., to Square D Company. Joint clip assembly for bus bars. 4,179,174, Cl. 339-22.00B.

Judd, George G., to Woodville Lime & Chemical Company. Preparation of pure magnesian values. 4,179,490, Cl. 423-165.000.

Jugle, Lawrence C.; Inderbitzen, Emil R.; and McDaniel, Paul W., to Union Carbide Corporation. Environmental sampling device. 4,178,794, Cl. 73-28.000.

Julich, Harry. Low-friction piston. 4,178,899, Cl. 123-193.00P.

Jumberca, S.A.: *See*—
Schreiner, Juan M., 4,178,779, Cl. 66-54.000.

Jung, Dieter: *See*—
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Jung, Fritz; and Kwech, Ludwig, to Perlmooser Zementwerke Aktiengesellschaft. Process for the utilization of waste substances and device for carrying out the process. 4,179,263, Cl. 432-1.000.

Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine-sugar derivatives, and their use as medicaments. 4,179,500, Cl. 424-180.000.

Juntgen, Harald: *See*—
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

Kabel-und Metallwerke Gutehoffnungshuette AG: *See*—
Tuschy, Eckhard; and Wischmeyer, Georg, 4,178,785, Cl. 72-78.000.

Kabmatik AB: *See*—
Storfossen, Asbjorn, 4,178,784, Cl. 72-47.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,178,849, Cl. 101-305.000.

Kaelin, Joseph R., to Union Carbide Corporation. Method for the biological purification of effluent and the plant for carrying out the process. 4,179,366, Cl. 210-14.000.

Kahling, Joachim: *See*—
Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, 4,179,508, Cl. 424-258.000.

Kaiser, Arthur: *See*—
Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., 4,179,704, Cl. 358-22.000.

Kalbskopf, Reinhard; and Trojer, Felix, to Battelle Memorial Institute. Method of forming a fire-resistant silicate coating. 4,179,535, Cl. 427-206.000.

Kamino, Yasumi: *See*—
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,179,412, Cl. 252-472.000.

Kaminow, Ivan P.; and Ramaswamy, Vellayan, to Bell Telephone Laboratories, Incorporated. Single polarization optical fibers and methods of fabrication. 4,179,189, Cl. 350-96.330.

Kamio, Takayoshi: *See*—
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, 4,179,293, Cl. 430-551.000.

Kane, Bernard J.; and Von Genk, Richard A., to SCM Corporation. Cyclic terpenoid onium salts, their preparation and uses. 4,179,468, Cl. 260-567.60M.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Tuzuki, Minoru; Matuba, Kuniyoshi; and Saito, Kazuo, 4,179,481, Cl. 525-80.000.

Kaneko, Chikara: *See*—
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,179,452, Cl. 260-397.200.

Kansas State University Research Foundation: *See*—
Sieb, Paul A.; Deyoe, Charles W.; and Hoseney, Russell C., 4,179,445, Cl. 260-340.90R.

Kapadia, Jayant K.: *See*—
Sahasrabudhe, Arun P.; and Kapadia, Jayant K., 4,179,629, Cl. 307-311.000.

Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., to Massachusetts Institute of Technology. Method of making a solar-cell array. 4,179,318, Cl. 148-187.000.

Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; by Kovtun, Lidia P., administrator; by Soshnikova, Inna V., administrator; and by Kovtun, Sergei V., administrator. Method of molding products from moist materials and apparatus realizing same. 4,179,258, Cl. 425-352.000.

Karl M. Reich Maschinenfabrik GmbH, Firma: *See*—
Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, 4,178,876, Cl. 118-681.000.

Karlin, Richard A.; McDonald, Robert W.; and Comiskey, Gary F., to Sun Electric Corporation. Voltage supply apparatus powered from a vehicular electrical system. 4,179,649, Cl. 320-13.000.

Karll, Bent, to Danfoss A/S. Compressor refrigerator. 4,178,771, Cl. 62-200.000.

Karns, Phil J.: *See*—
Cann, Peter L.; Karns, Phil J.; and Honnold, Fred V., 4,178,988, Cl. 165-2.000.

Karpati, Egon: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,467, Cl. 260-563.00R.

Kasamatsu, Hiroshi; and Suzuki, Koshiro. Anticorrosive paints for oil containers. 4,179,536, Cl. 427-239.000.

Kasegrande, Stephen S.: *See*—
Irani, Cyrus A.; Kasegrande, Stephen S.; McHugh, Daniel J.; and Leder, Frederic, 4,179,362, Cl. 208-321.000.

Kashiwagi, Nobuo: *See*—
Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, 4,178,983, Cl. 164-113.000.

Kato, Eiichi: *See*—
Sugiyama, Masatoshi; and Kato, Eiichi, 4,179,294, Cl. 430-522.00A.

Kato, Seinosuke: *See*—
Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, 4,178,868, Cl. 114-74.00R.

Katow, Keigo: *See*—
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,178,666, Cl. 29-156.70R.

Kaufmann, Jochen; Berg, Markus; and Krings, Peter, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Phosphate-free textile detergent, especially for washing at temperatures of over 75° C. 4,179,391, Cl. 252-99.000.

Kautex-Werke Reinold Hagen GmbH: *See*—
Hess, Dieter; Friedrichs, Carsten; and Daubenbuchel, Werner, 4,179,251, Cl. 425-140.000.

Kawagishi, Shigemitsu: *See*—
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Kawai Musical Instrument Mfg. Co. Ltd.: *See*—
Deutsch, Ralph, 4,178,825, Cl. 84-1.240.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,617, Cl. 250-531.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,618, Cl. 250-531.000.
Uchinishi, Eizaburo, 4,178,886, Cl. 123-73.00A.

Kawasaki, Masahiro: *See*—
Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, 4,179,201, Cl. 354-41.000.

Kawecki Berylco Industries, Inc.: *See*—
Wikle, Keith G., 4,179,314, Cl. 148-12.70C.

Kawolics, Raymond P., to Meyer Dairy Products Company, The. Closure fastening means. 4,179,039, Cl. 220-319.000.

Kazda, Stanislav: *See*—
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Keane, William J.; and Mezak, John A., to Eaton Corporation. Compact RF structure for nonreciprocal ferromagnetic resonance coupling. 4,179,674, Cl. 333-204.000.

Keller, Hansjurg, to Cerberus AG. Infrared intrusion detector circuit. 4,179,691, Cl. 340-567.000.

Keller, John H.; McKenna, Charles M.; and Winnard, James R., to International Business Machines Corporation. Formation of epitaxial layers doped with conductivity-determining impurities by ion deposition. 4,179,312, Cl. 148-1.500.

Kelly, Donald A. Magnetic wheel drive. 4,179,633, Cl. 310-80.000.

Kelmanski, Pedro. Tennis racket with adjustable weight. 4,179,121, Cl. 273-73.00R.

Kemp, Willard E.; and Morrison, Bert L., to ACF Industries, Incorporated. Method of making a fabricated gate valve. 4,178,665, Cl. 29-157.10R.

Kemper, Yves J.; and Bigot, Lucien, to Vadetec Corporation. Variable speed transmission device. 4,178,812, Cl. 74-745.000.

Kendall Company, The: *See*—
Jackson, Knute D., 4,178,735, Cl. 53-473.000.
Taylor, Glenn N.; and Patel, Bhupendra C., 4,178,937, Cl. 128-349.00B.

Kennecke, Mario: *See*—
Weber, Alfred; Kennecke, Mario; and Dahi, Helmut, 4,179,336, Cl. 435-55.000.

Kent, James K., Jr. Method and apparatus for securing fabric tops to a vehicle. 4,179,152, Cl. 296-196.000.

Kenyon, Robert S.: *See*—
Garnett, John L.; and Kenyon, Robert S., 4,179,401, Cl. 252-429.00R.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Dustmann, Cord-Henrich; Schmidt, Curt; and Pasztor, Gabriel, 4,178,676, Cl. 29-599.000.

Kerr, Elmer L.: *See*—
Zeigler, Jon G.; Kerr, Elmer L.; and Bell, David V., 4,179,603, Cl. 219-538.000.

Kerr-McGee Corporation: *See*—
Murray, Edward C., 4,178,981, Cl. 164-72.000.

Ketley, Arthur D.: *See*—
Tsao, Jung-Hsien; and Ketley, Arthur D., 4,179,400, Cl. 252-429.00R.

Ketterling, Edwin; and Nelson, Benjamin R., to White Farm Equipment Company. Flow control means. 4,178,757, Cl. 60-548.000.

Keznickl, Eduard: *See*—
Freudenschuss, Otto; Keznickl, Eduard; and Patels, Gottfried, 4,179,191, Cl. 350-187.000.

Khaimovich, Isaak R.: *See*—
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.

Khan, Sultan W.; Ham, John K.; and Strissel, Richard A., to Data-Products Corporation. Microprogrammable processor control printer system. 4,179,732, Cl. 364-200.000.

Khotilin, Alexandr I.: *See*—
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.

Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, to Deutsche Gold-und Silber-Scheideanstalt vormals Rosseler. Precipitated silicic acid granules. 4,179,431, Cl. 260-42.370.

Kim, Dongsung R., to Burroughs Corporation. Means and methods for providing greater speed and flexibility of microinstruction sequencing. 4,179,737, Cl. 364-200.000.

Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., to Shell Oil Company. Resin-metal-ligand composition. 4,179,402, Cl. 252-431.00C.

Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., to Shell Oil Company. Resin-ligand-metal complex compositions. 4,179,403, Cl. 252-431.00C.

Kimijima, Takahiro: *See*—
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, 4,179,624, Cl. 307-3.000.

Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, to Mita Industrial Co., Ltd.; and Mita Industrial Co., Ltd. Electrostatic photographic copying machine. 4,179,211, Cl. 355-14.00R.

Kimwood Corporation: *See*—
Evans, F. David, 4,178,721, Cl. 51-139.000.

Kine, Masayoshi, to Shimano Industrial Company Limited. Means for ensuring securement of a brake rotary body to a wheel hub. 4,179,013, Cl. 188-26.000.

Kingsbury, Nicholas G., to Marconi Company Limited, The. Frequency synthesizer with fractional division ratio and jitter compensation. 4,179,670, Cl. 331-10.000.

Kinyon, Brice W.: *See*—
Cassell, Don S.; and Kinyon, Brice W., 4,178,801, Cl. 73-195.000.

Kioritz Corporation: *See*—
Inaga, Hisashi, 4,178,685, Cl. 30-381.000.

Kirkpatrick, Allen R., to Spire Corporation. Process for fabricating thin film and glass sheet laminate. 4,179,324, Cl. 156-230.000.

Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Angiotensin II antagonist peptides containing an alpha-aminooxyacid in the position-1. 4,179,433, Cl. 260-112.50R.

Kishi, Hirotoshi: *See*—
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, 4,179,116, Cl. 271-306.000.

Kiss, Bella: *See*—
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
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Kita, Takahiro: *See*—
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.

Kitagawa, Takaich: *See*—
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.

Kitagawa, Toshikatsu, to Miyakawa Industry Company Limited. Multiple spindle drilling machine for wide flange beams. 4,179,229, Cl. 408-39.000.

Kitagawa, Toshikatsu, to Miyakawa Industry Company Limited. Multiple spindle drilling machine for wide flange beams. 4,179,230, Cl. 408-39.000.

Kitajima, Sigenori: *See*—
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,178,884, Cl. 123-32.0EE.

Kitamoto, Tatsuji: *See*—
Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, 4,179,387, Cl. 252-62.560.

Kittag, Gerd: *See*—
Freudenschuss, Otto; and Kittag, Gerd, 4,179,713, Cl. 360-27.000.

Kittl, Hans: *See*—
Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, 4,179,578, Cl. 560-76.000.

Kivel, Bennett, to Jersey Nuclear-Avco Isotopes, Inc. Laser isotope separation using selective inhibition and encouragement of dimer formation. 4,179,272, Cl. 55-1.000.

Kiyota, Yuhiko: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Klauke, Erich: *See*—
Marhold, Albrecht; and Klauke, Erich, 4,179,461, Cl. 260-465.00H.

Klein, Keith W. Self-cleating rope holder. 4,178,661, Cl. 24-130.000.

Klein, Michael G.: *See*—
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., 4,179,446, Cl. 260-343.600.

Kleinewefers Gesellschaft mit beschrankter Haftung: *See*—
Schiffer, Gunter, 4,178,782, Cl. 68-5.00D.

Kleinschmidt, Albert W., to J. R. Short Milling Company. Methods for forming stable dispersions of glutens which tend to agglomerate. 4,179,525, Cl. 426-19.000.

Klieves, Hal. Diaphragm valve and valve system. 4,178,954, Cl. 137-119.000.

Klimazewski, Leo T.; and McNairy, James A., to ACF Industries, Incorporated. Forced air control valve for exhaust system of internal combustion engine. 4,178,755, Cl. 60-290.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Weigel, Horst; and Muller, Karl, 4,179,284, Cl. 75-92.000.

Klupfel, Kurt-Walter; and Sprengel, Heide, to Hoechst Aktiengesellschaft. Light-sensitive copying composition. 4,179,292, Cl. 430-175.000.

Knapp, Heinrich; and Hans, Waldemar, to Robert Bosch GmbH. Electromagnetically operated fuel injection valve. 4,179,069, Cl. 239-125.000.

Knight, Jack B., to Philip Morris Incorporated. Apparatus and method for control of air relative humidity with reduced energy usage in the treatment of tobacco. 4,178,946, Cl. 131-135.000.

Knoblauch, Karl: *See*—
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

Knosp, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Silver free, low gold-noble metal alloys for firing of dental porcelain. 4,179,286, Cl. 75-134.00N.

Kobayashi, Akio: *See*—
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,178,884, Cl. 123-32.0EE.

Kobayashi, Minoru, to Olympus Optical Company, Ltd. Method of recording an index signal in dictating tape recorder. 4,179,714, Cl. 360-61.000.

Kobayashi, Toshihiko: *See*—
Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, 4,179,719, Cl. 360-112.000.

Koch, James H.; and Ritzenthaler, Richard A., to N L Industries, Inc. Method of making an article having a cast-in place bearing. 4,179,313, Cl. 148-3.000.

Kodama, Mikio: *See*—
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Koehler, Charles E.: *See*—
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,179,094, Cl. 249-82.000.

Koenig, Karl-Heinz: *See*—
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, 4,179,465, Cl. 260-544.00C.

Kohler, Robert: *See*—
Bestenreiner, Friedrich; Giglberger, Dieter; Hoeft, Karl; and Kohler, Robert, 4,179,210, Cl. 355-10.000.

Kokkonen, Olavi: *See*—
Ilmoniemi, Erkki; and Kokkonen, Olavi, 4,179,332, Cl. 162-380.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, 4,179,719, Cl. 360-112.000.
Sakai, Kazuo; Akiba, Shigeyuki; and Yamamoto, Takaya, 4,179,317, Cl. 148-171.000.

Kokusai Gijutsu Kaihatsu Co., Ltd.: *See*—
Nakauchi, Shunsaku; and Takahashi, Akifusa, 4,179,606, Cl. 250-339.000.

Kollensperger, Friedrich-Gero; Hartleben, York; Kretzschmar, Rolf; and Neteler, Bernhard. 4-(Alpha-hydroxy-isopropyl)-5-phenyl-oxazolidin-2-one. 4,179,442, Cl. 548-232.000.

Konishi, Hiromu; and Nishiwaki, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Braking pressure control valve unit. 4,179,164, Cl. 303-24.00F.

Konishiroku Photo Industry Co., Ltd.: *See*—
Morishita, Taneji, 4,179,077, Cl. 242-55.000.
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,179,601, Cl. 219-216.000.

Konno, Toshiro: *See*—
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.

Konstantinova, Kina V.: *See*—
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., 4,179,460, Cl. 260-455.00R.

Konther Chamorro, Sigfrido: *See*—
Konther, Siegfried; Konther Chamorro, Sigfrido; and Konther Chamorro, Udi, 4,178,885, Cl. 123-44.00C.

Konther Chamorro, Udi: *See*—
Konther, Siegfried; Konther Chamorro, Sigfrido; and Konther Chamorro, Udi, 4,178,885, Cl. 123-44.00C.

Konther, Siegfried; Konther Chamorro, Sigfrido; and Konther Chamorro, Udi. Rotary piston/cylinder engines. 4,178,885, Cl. 123-44.00C.

Kooi, Edward: *See*—
Adams, Leo; and Kooi, Edward, 4,178,652, Cl. 15-302.000.

Koppelmann, Edgar: *See*—
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Koppers Company, Inc.: *See*—
Fischer, John, 4,179,043, Cl. 222-368.000.

Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the deposition of pure semiconductor material. 4,179,530, Cl. 427-51.000.

Koren, James T. Bow draw indicator and sighting device. 4,179,613, Cl. 250-215.000.

Koshiba, Masao: *See*—
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.

Kosiak, Michael, to Medrest Corporation. Tapered roller pressure relief support. 4,178,921, Cl. 128-58.000.

Koster, Kari: *See*—
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.

Kosto, Timothy J., to Union Carbide Corporation. Method for adding manganese to a molten magnesium bath. 4,179,287, Cl. 75-168.00E.

Kosugi, Masao; and Yoshinari, Hideki, to Canon Kabushiki Kaisha. Method for opposing a sheet-like material to a standard plane with predetermined space therebetween. 4,179,110, Cl. 270-58.000.

Kothmann, Richard E., to Westinghouse Electric Corp. Cooled turbine blade. 4,179,240, Cl. 416-96.00R.

Kotoyori, Akira, to Hitachi, Ltd. Screen coating system for panel of color picture tube. 4,179,200, Cl. 354-1.000.

Kouse, Charles H.; and Herzog, James L., to Carrier Corporation. Tube cleaning device. 4,178,649, Cl. 15-104.06R.

Kovtun, Lidia P., administrator: *See*—
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Kovtun, Sergei V., administrator: *See*—
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Kovtun, Vasily A., deceased: *See*—
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Kozacka, Frederick J.; and Perreault, Richard J., to Gould Inc. Combination of fusible elements for electric fuses. 4,179,677, Cl. 337-161.000.

Kozacka, Wayne R., to Wahlco, Inc. Industrial sulfur trioxide gas injection probe and method of manufacture. 4,179,071, Cl. 239-397.500.

Kozlowski, George J., Jr., to Rudolph Beaver, Inc. Sharpness testing machine. 4,178,797, Cl. 73-104.000.

Kraemling, Franz: *See*—
Ortmanns, Gunther; Kraemling, Franz; and Pikhard, Siegfried, 4,178,728, Cl. 52-232.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Beermann, Heinrich, 4,179,635, Cl. 310-214.000.

Krapcho, John; and Schwartz, Joseph, to E. R. Squibb & Sons, Inc. Naphthalenone derivatives and analogs. 4,179,558, Cl. 544-174.000.

Krasnov, Jury N.: *See*—
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.

Kraus, Hubert; and Strehl, Peter, to Gesellschaft fur Schwerionenforschung mbH, Darmstadt. Faraday dish for making measurements at the beam paths of a heavy ion accelerator. 4,179,615, Cl. 250-489.000.

Krause, William A.; and Shea, Evan P., to Omnipure, Inc. System for electrocatalytic treatment of waste water streams. 4,179,347, Cl. 204-149.000.

Kreher, Alfons: *See*—
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.

Kretzschmar, Rolf: *See*—
Kollensperger, Friedrich-Gero; Hartleben, York; Kretzschmar, Rolf; and Neteler, Bernhard, 4,179,442, Cl. 548-232.000.

Krings, Peter: *See*—
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Kaufmann, Jochen; Berg, Markus; and Krings, Peter, 4,179,391, Cl. 252-99.000.

Kripalani, Kishin J.: *See—*
Cohen, Allen I.; and Kripalani, Kishin J., 4,179,568, Cl. 546-208.000.
Kruesi, Paul R., to Cato Research Corp. Process for making rare earth metal chlorides. 4,179,492, Cl. 423-263.000.
Krulwich, Lester S. Magnetic press for vises. 4,179,105, Cl. 269-8.000.
Krumeich, Jorg; and Rossler, Hermann, to Hermann Rossler. Method and apparatus for determining the strabismus angle between the optical axes of a fixing and a strabismic eye. 4,179,195, Cl. 351-4.000.
Kubota, Kenichi: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Kucharczyk, Eckhard: *See—*
Frank, Gerhard; and Kucharczyk, Eckhard, 4,178,841, Cl. 98-98.000.
Kuda, Vladimir: *See—*
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, 4,178,971, Cl. 139-435.000.
Kudo, Daiziro, to Fujitsu Limited. Apparatus for plasma treatment of semiconductor materials. 4,178,877, Cl. 118-728.000.
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, to Fujitsu Limited. Process for the vapor growth of a thin film. 4,179,326, Cl. 156-612.000.
Kudryashov, Sergei A.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.
Kudryashova, Galina A.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.
Kuhling, Dieter: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Kulikov, Valentin V.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.
Kunise, Satoru: *See—*
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,617, Cl. 250-531.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, 4,179,618, Cl. 250-531.000.
Kunz, Peter, to Mettler Instrumente AG. Weighing apparatus calibration means and method. 4,179,005, Cl. 177-212.000.
Kuraray Co., Ltd.: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.
Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens stop braking in automatic exposure cameras of stop value control type. 4,179,201, Cl. 354-41.000.
Kusakata, Shigeru: *See—*
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Kusama, You: *See—*
Miyama, Masao; Yamaguti, Sakan; and Kusama, You, 4,179,541, Cl. 428-165.000.
Kutniewski, Donald F.: *See—*
Clayton, William J.; and Kutniewski, Donald F., 4,179,270, Cl. 44-40.000.
Kutter, Eberhard: *See—*
Austel, Volkhard; Kutter, Eberhard; Eberlein, Wolfgang; Heider, Joachim; and Kahling, Joachim, 4,179,508, Cl. 424-258.000.
Kwan, Okun; and Zaccagnino, Nicholas, to Bunker Ramo Corporation. Printer center sensing mechanism. 4,179,223, Cl. 400-320.000.
Kwech, Ludwig: *See—*
Jung, Fritz; and Kwech, Ludwig, 4,179,263, Cl. 432-1.000.
Kyushu Refractories Co., Ltd.: *See—*
Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, 4,179,496, Cl. 423-598.000.
L. M. Ericsson Pty. Ltd.: *See—*
Herschtal, Ludwik, 4,179,587, Cl. 179-15.0AT.
La-Z-Boy Chair Company: *See—*
Shoemaker, Edwin J.; Pacitti, William; and Baumann, Marvin J., 4,179,157, Cl. 297-83.000.
Laboratoires Sarget: *See—*
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.
Laboratorios Made, S.A.: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.
Laby, Jordan M., to American Shower Door Co., Inc. Door assembly for a tub and shower enclosure. 4,178,718, Cl. 49-411.000.
Lacroix, Roger; and Mollet, Hans, to Ciba-Geigy Corporation. Stable, highly concentrated dyestuff solutions miscible with water in any proportion. 4,179,267, Cl. 8-41.00R.
Ladd, Arnold M.: *See—*
Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., 4,179,170, Cl. 339-14.00R.
Ladd, Thyril L., Jr.: *See—*
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., 4,179,446, Cl. 260-343.600.
Laforest, Jacqueline: *See—*
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, 4,179,516, Cl. 424-278.000.
Laganis, Deno, to Schenectady Chemicals, Inc. Water soluble insulating varnish. 4,179,420, Cl. 260-21.000.
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Lahr, Roy J., to Xerox Corporation. Demand publishing royalty accounting system. 4,179,212, Cl. 355-14.00R.
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Bentz, Gerard; and Racouchot, Bernard, 4,179,103, Cl. 266-225.000.
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Laitkep, Anthony A.; Meyer, Danny S.; and Saka, Hamid J., to ACF Industries, Incorporated. Spacer plates for gate valve seat assemblies. 4,179,098, Cl. 251-167.000.
Lamorte, Michael F., to Research Triangle Institute. Cascade solar cells. 4,179,702, Cl. 357-30.000.
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Land, Edwin H., to Polaroid Corporation. Combination motion picture camera and viewing apparatus. 4,179,199, Cl. 352-138.000.
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Lange, Frederick F., to Rockwell International Corporation. Method of protecting Si_3N_4 ceramic alloy during heating. 4,179,486, Cl. 264-65.000.
Lange, Kai; and Jeppesen, Jorgen, to General Electric Company. Gamma camera system with improved means for correcting nonuniformity. 4,179,607, Cl. 250-363.00S.
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Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,179,235, Cl. 414-351.000.
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Du Broff, Warren, 4,178,739, Cl. 53-588.000.
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., to Deepsea Ventures, Inc. Suction nozzle dredge head. 4,178,704, Cl. 37-57.000.
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Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.
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Crean, Peter A.; Lavallee, Pierre A.; and Agulnek, Martin A., 4,179,621, Cl. 250-566.000.
Lawrie, Donald, to Singer Company, The. Feed cam rephasing device. 4,178,863, Cl. 112-158.00D.
Lea-Ronal, Inc.: *See* –
Thomson, Donald W., 4,179,344, Cl. 204-44.000.
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Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.
Leder, Frederic: *See—*
Irani, Cyrus A.; Kasegrande, Stephen S.; McHugh, Daniel J.; and Leder, Frederic, 4,179,362, Cl. 208-321.000.
Lee, Chin K.: *See—*
Long, Margaret E.; and Lee, Chin K., 4,179,335, Cl. 435-99.000.
Lee, Floyd W.: *See—*
Yates, Willard L.; and Lee, Floyd W., 4,179,269, Cl. 44-10.00B.
Lee, Robert E.: *See—*
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Hance, Richard J.; and Wiese, John R., 4,179,309, Cl. 136-234.000.
Lehmer, Wilhelm: *See—*
Baldus, Wolfgang; and Lehmer, Wilhelm, 4,178,776, Cl. 62-538.000.
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Fairchild, Peter T.; and Leininger, Joel C., 4,179,738, Cl. 364-200.000.
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LeTourneau, Ted L. Structure and arrangement for loudspeaker assemblage. 4,179,008, Cl. 181-147.000.
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Abbott, Horace P., 4,179,052, Cl. 222-509.000.
Levin, Jonathan S., to RCA Corporation. Flow controller. 4,178,974, Cl. 141-51.000.
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Zeis, Jurgen, 4,179,660, Cl. 325-59.000.
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, to Bergwerksverband GmbH. Method of regenerating adsorbents. 4,179,399, Cl. 252-411.00S.
Lichtenstein, Bernard. Contact crimping machine. 4,178,679, Cl. 29-715.000.
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Sigmon, Ned A., 4,179,323, Cl. 156-201.000.
Lightfoot, Herbert D., to Domtar Inc. Linear corrugating roll deflection control. 4,179,253, Cl. 425-369.000.
Limberg, Jaroslav; Limberg, Tomas; and Rayman, Vaclav, to Hutni project Praha, projekcni a inzenyrska. Apparatus for supplying preheated coal charges to coking chambers. 4,179,340, Cl. 202-262.000.
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Baldus, Wolfgang; and Lehmer, Wilhelm, 4,178,776, Cl. 62-538.000.
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Gabel, Robert K.; Lindenberger, William H.; and Pavilcius, Audrone M., 4,179,396, Cl. 252-329.000.
Lindenborg, Jon M., to Western Electric Company, Inc. Method and circuit for controlling the output signal of a variable control circuit. 4,179,666, Cl. 330-138.000.
Lipinski, Thomas E.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.
Little, Carl H., to Weber-Knapp Company. Counterbalance mechanism. 4,178,655, Cl. 16-52.000.
Littlefield, John V. Display apparatus utilizing magnetic materials. 4,178,707, Cl. 40-426.000.
Litton Systems, Inc.: *See—*
Bjork, Lennart W., 4,179,596, Cl. 219-10.55M.
Liu, Sheau-Ming S.; Owen, William H., III; and Pashley, Richard D., to Intel Corporation. Process for forming a contact region between layers of polysilicon with an integral polysilicon resistor. 4,178,674, Cl. 29-571.000.
Lodi, Franco, to Ing. C. Olivetti & C., S.p.A. Computer with an arrangement for changing its working environment. 4,179,735, Cl. 364-200.000.
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Meyer, Louis C., 4,178,638, Cl. 3-1.500.
Lofdahl, Clyde A., to Raychem Corporation. Heat recoverable article and methods using same. 4,179,319, Cl. 156-86.000.
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Longfellow, Forrest E. Protective animal goggles. 4,178,742, Cl. 54-80.000.
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Lonza Ltd.: *See—*
Christensen, Kresten, 4,179,499, Cl. 424-143.000.
Loomis, Louie P. Structuralization of rules. 4,179,129, Cl. 273-272.000.
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Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,179,530, Cl. 427-51.000.
Losee, David L.; and Wilder, Alvin D., to Eastman Kodak Company. Method of making silicon device with uniformly thick polysilicon. 4,179,528, Cl. 427-9.000.
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Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.
Lowden, Lawrence C., to Whitaker Cable Corporation. Electrical connector having multiple terminal receptacle receiving different plugs. 4,179,179, Cl. 339-186.00M.
Lowe, Carl W., to Magtronics Incorporated. Method and apparatus for analyzing performance of electric-traction-motor powered vehicles and electrical operating components thereof. 4,179,744, Cl. 364-551.000.
Lowenthal, Hans, to Colibri Lighters Limited. Smokers' lighter. 4,179,260, Cl. 431-255.000.
Lu, Chin H.: *See—*
Rahn, Arthur W.; Jones, Lewis O.; and Lu, Chin H., 4,179,388, Cl. 430-108.000.
Lubrizol Corporation, The: *See—*
Ripple, David E., 4,179,449, Cl. 260-346.740.
Lucas Industries Limited: *See—*
Worby, Donald, 4,179,072, Cl. 239-533.900.
Lucke, Roland, to Gebruder Lodige Maschinenbaugesellschaft mbH. Plough-share-like mixing tool. 4,179,221, Cl. 366-309.000.
Lukacsek, Patricia A. Method and apparatus for culturing and examining fungi. 4,179,266, Cl. 435-254.000.
Lummus Company, The: *See—*
Cox, Robert P., 4,179,473, Cl. 585-313.000.
Lumsden, John, to Mineral Process Licensing Corporation B.V. Chlorination of iron-containing materials. 4,179,489, Cl. 423-79.000.
Lund, Lloyd W. Kitchen countertop wood or coal stove. 4,178,906, Cl. 126-6.000.
Lunden, Clarence D., to Boeing Company, The. Low reflectivity radome. 4,179,699, Cl. 343-872.000.
Lundquist, Ingemar H., to Valleylab. Intravenous liquid delivery system. 4,178,927, Cl. 128-214.00F.
Lura, Loren E.; and Zeigler, Philip B., to General Motors Corporation. Antifriction bearing with multiple piece race. 4,179,167, Cl. 308-189.00A.
Luttig, Dale. Tie preplating method and apparatus. 4,178,671, Cl. 29-429.000.
Lynch, Christian P.: *See—*
Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., 4,179,611, Cl. 235-92.0QC.
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, to Block Drug Company, Inc. Alkyl amine oxide toxicants. 4,179,504, Cl. 424-248.400.
Lyon, Jarrel D., to Western Electric Company, Inc. Wire wrapping device incorporating releasable bit locking mechanism controlled by insertion depth of terminal. 4,178,680, Cl. 29-751.000.
M. Morell Packaging Co., Inc.: *See—*
Gallina, Salvatore; and Davidson, Stan, 4,178,821, Cl. 84-1.010.
MacDonough, Francis X., to Tapecon, Inc. Electric circuit for accessory for host tape recorder. 4,179,715, Cl. 360-61.000.
MacFarlane, Walter J., to Stanley Works, The. Glide for drapery traverse rod. 4,178,656, Cl. 16-93.00D.
Madden, Thomas C.: *See—*
Carrillo, Leo; and Madden, Thomas C., 4,178,678, Cl. 29-625.000.
Madland, Thorvald, to Youngstown Steel Door Company, The. Rail house car door wear skids. 4,178,857, Cl. 105-378.000.
Maeda, Kazuo: *See—*
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, 4,179,326, Cl. 156-612.000.
Maeda, Masaya: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Magtronics Incorporated: *See—*
Lowe, Carl W., 4,179,744, Cl. 364-551.000.
Maguire, David E., to Union Carbide Corporation. Conformally epoxy coated electrolyte capacitor having axial leads. 4,179,725, Cl. 361-433.000.
Mahler, Henry W.: *See—*
Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., 4,179,704, Cl. 358-22.000.
Mahon, Fred F. Vibration dampening device for rotating disk. 4,178,819, Cl. 82-38.00A.
Maisel, Hans. Needle bed for flat knitting machine. 4,178,780, Cl. 66-115.000.
Maisonneuve, Hubert, to Canron Inc. Mechanical hydro servo valve. 4,178,836, Cl. 91-381.000.
Makhtjuk, Iosif L.: *See—*
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.
Makovec, Donald J.; and Haskell, Donald M., to Phillips Petroleum Company. Olefin feed in HF alkylation of isoparaffin with olefin. 4,179,475, Cl. 585-714.000.

Makowski, Henry S.; and O'Farrell, Charles P., to Exxon Research & Engineering Co. Elastomeric blend compositions of a sulfonated elastomer polymer and a crystalline polyolefinic thermoplastic resin. 4,179,422, Cl. 260-28.50B.

Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Method of and apparatus for inserting weft threads into a jet loom. 4,178,971, Cl. 139-435.000.

Malin, John R. Vehicle performance analyzer. 4,179,740, Cl. 364-442.000.

Mallory, William K. Stringed instrument construction. 4,178,827, Cl. 84-291.000.

Mandel, Alan F.: *See—*
Coyle, Forrest E.; and Mandel, Alan F., 4,179,594, Cl. 200-310.000.

Mann, James T., to Gulf Research and Development Company. Stabilized hydraulic fluid. 4,179,384, Cl. 252-32.70E.

Mann, James T., to Gulf Research and Development Company. Stabilized hydraulic fluid. 4,179,389, Cl. 252-32.70E.

Mansfield, Donna J. Toilet paper dispenser. 4,179,078, Cl. 242-55.530.

Mar-Kal Products Corporation: *See—*
Schmid, Hans F., 4,178,710, Cl. 40-530.000.

Marcandalli, Ulderico, to Rockwell-Rimoldi, S.p.A. Looper control apparatus for sewing machines. 4,178,864, Cl. 112-159.000.

Marchal, Paul: *See—*
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, 4,179,035, Cl. 414-2.000.

Marchi, Egidio; and Montecchi, Lauretta, to Alfa Farmaceutici, S.p.A. Process for the preparation of 3 iodo- and 3 bromorifamycin s. 4,179,438, Cl. 260-239.30P.

Marconi Company Limited, The: *See—*
Kingsbury, Nicholas G., 4,179,670, Cl. 331-10.000.

Margolin, Jed. Electronic video game. 4,179,124, Cl. 273-101.200.

Marhold, Albrecht; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of diphenyl ethers. 4,179,461, Cl. 260-465.00H.

Marple, Elwood, to Hargraves Aerobic Systems, Inc. Rotary low pressure air displacement pump. 4,179,244, Cl. 417-273.000.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel UCLAF. Polyhalogenated carboxylic acids. 4,179,575, Cl. 562-506.000.

Martinez, Carlos J., to Mobil Oil Corporation. Epoxy emulsion water-based coating using water-dispersible epoxy emulsifier. 4,179,440, Cl. 260-29.40R.

Martinez Roldan, Cristobal: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

Martino, Peter V. Horizontal one step automatic plate processor. 4,179,208, Cl. 354-320.000.

Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, to Shin Meiwa Industry Co., Ltd. Method and system of velocity control for automatic welding apparatus. 4,179,602, Cl. 219-125.100.

Marx, Paul: *See—*
Vetter, Hans; and Marx, Paul, 4,179,291, Cl. 430-223.000.

Masco Corporation of Indiana: *See—*
Pflasterer, Peter W., 4,179,662, Cl. 325-470.000.

Massachusetts Institute of Technology: *See—*
Kaplow, Roy; Frank, Robert I.; and Goodrich, Joel L., 4,179,318, Cl. 148-187.000.

Massey-Ferguson Services N.V.: *See—*
Allely, Robert; and Bailey, Alfred J., 4,178,744, Cl. 56-16.200.
Allely, Robert, 4,178,746, Cl. 56-53.000.

Masuda, Akira: *See—*
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,178,884, Cl. 123-32.0EE.

Masuzawa, Sigeaki: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,179,584, Cl. 179-1.0SM.

Mathews, Georgina H., executrix: *See—*
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.

Mathews, Mitford M., Jr., deceased (by Mathews, Georgina H., executrix); Tremain, Thomas E.; and Zmurko, Myron T., to United States of America, Army. System of encoded speech transmission and reception. 4,179,586, Cl. 179-1.50R.

Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 2-Amino-cyclopent-1-ene-1-dithiocarboxylic acids. 4,179,463, Cl. 260-502.600.

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Matsuda, Akio: *See—*
Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, 4,178,868, Cl. 114-74.00R.

Matsuda, Mutsuhide: *See—*
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.

Matsuda, Yasuo: *See—*
Muto, Nobuyoshi; Matsuda, Yasuo; and Honda, Kazuo, 4,179,727, Cl. 363-41.000.

Matsui, Masao: *See—*
Ito, Akira; and Matsui, Masao, 4,178,994, Cl. 169-52.000.

Matsui, Takeshi: *See—*
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.

Matsumoto, Haruo: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,179,673, Cl. 333-204.000.

Matsumoto, Takuzo: *See—*
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.

Matsunaga, Isao: *See—*
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,179,452, Cl. 260-397.200.

Matsuoka, Fumio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt system. 4,179,136, Cl. 280-744.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.

Matsushita Reiki Corp., Ltd.: *See—*
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.

Mattson, John P., to Solarspan, Inc. Solar energy heat collector. 4,178,911, Cl. 126-449.000.

Matuba, Kuniyoshi: *See—*
Tuzuki, Minoru; Matuba, Kuniyoshi; and Saito, Kazuo, 4,179,481, Cl. 525-80.000.

Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R. High-speed anvilless hammer. 4,178,792, Cl. 72-436.000.

Mauceri, Frank A.: *See—*
Bradley, Robert L.; and Mauceri, Frank A., 4,179,369, Cl. 210-43.000.

Maurer, Robert D., to Corning Glass Works. Multiple mode waveguide having cylindrical perturbations. 4,179,187, Cl. 350-96.300.

Maxey, Alexander R., to Arvin Industries, Inc. Method and apparatus for video signal recording. 4,179,717, Cl. 360-84.000.

May, Denis R. W., to J. E. Hanger & Company Limited. Knee joint structure for artificial legs. 4,178,642, Cl. 3-28.000.

Mayer, Hubert J. M., to Bata-Schuh-Aktiengesellschaft. Golf-shoe sole. 4,178,702, Cl. 36-59.00R.

Mayer, Jurgen, to Robert Bosch GmbH. Wiping arrangement for a vehicle window. 4,178,651, Cl. 15-250.320.

Mayer, Paul C.: *See—*
Fethke, Wayne G.; and Mayer, Paul C., 4,179,029, Cl. 206-349.000.

Mazon, Gus G., III. Rotating wear rings for swimming pool whip hoses. 4,178,949, Cl. 134-167.00R.

Mazzei, Alessandro: *See—*
Dozzi, Giovanni; Cucinella, Salvatore; and Mazzei, Alessandro, 4,179,459, Cl. 260-448.00R.

Mazzorana, Alfred, to Societe de Paris et du Rhone. Starters for internal combustion engine. 4,178,805, Cl. 74-6.000.

McCall, John M., to Upjohn Company, The. Methods of treating psychosis. 4,179,510, Cl. 424-267.000.

McCoskey, J. Marion; and Webb, R. Britton. Portable electronic musical instrument. 4,178,823, Cl. 84-1.010.

McCourry, Phyllis J.; and Fuhrman, Victoria L. Tensioning device for a dental flossing apparatus. 4,178,947, Cl. 132-92.00R.

McCoy, Robert J.: *See—*
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.

McDaniel, Paul W.: *See—*
Jugle, Lawrence C.; Inderbitzen, Emil R.; and McDaniel, Paul W., 4,178,794, Cl. 73-28.000.

McDonald, Robert W.: *See—*
Karlin, Richard A.; McDonald, Robert W.; and Comiskey, Gary F., 4,179,649, Cl. 320-13.000.

McGahren, William J.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., 4,179,451, Cl. 260-395.000.

McGann, Rodney: *See—*
Paull, Peter L.; and McGann, Rodney, 4,178,758, Cl. 60-648.000.

McHugh, Daniel J.: *See—*
Irani, Cyrus A.; Kasegrande, Stephen S.; McHugh, Daniel J.; and Leder, Frederic, 4,179,362, Cl. 208-321.000.

McKenna, Charles M.: *See—*
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,179,312, Cl. 148-1.500.

McLoughlin, Nelson E. Roller with replaceable sleeve. 4,178,664, Cl. 29-130.000.

McMaster, James T.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.

McMurtry, Carl H.: *See—*
Coppola, John A.; Hailey, Laurence N.; and McMurtry, Carl H., 4,179,299, Cl. 106-44.000.

McNairy, James A.: *See—*
Klimazewski, Leo T.; and McNairy, James A., 4,178,755, Cl. 60-290.000.

McNamara, Elger W. Diabetic insulin alarm system. 4,178,916, Cl. 128-734.000.

McNaney, Joseph T. Graphic symbol display system. 4,179,689, Cl. 340-378.300.

McVay, James V.; and Yates, Patrick A., to United States of America, Navy. Explosive actuated arming switch device. 4,178,855, Cl. 102-262.000.

Mechler, Paul A.: *See—*
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.

Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, to Yissum Research Development Company of the Hebrew University of Jerusalem. Novel tetrahydrocannabinol type compounds. 4,179,517, Cl. 424-283.000.

Medrest Corporation: *See—*
Kosiak, Michael, 4,178,921, Cl. 128-58.000.

Mehta, Anil B.; and Zielinski, Richard J., to SCM Corporation. Production of hydrogenated fatty acids from crude glyceride oils. 4,179,454, Cl. 260-409.000.

Mehta, Gunvant N.: *See—*
Cohen, Edward M.; Grim, Wayne M.; Harwood, Richard J.; and Mehta, Gunvant N., 4,179,497, Cl. 424-22.000.

Meininger, Karl. Archery bow. 4,178,904, Cl. 124-23.00R.

Meissner, David C.: *See—*
Beggs, Donald; and Meissner, David C., 4,179,278, Cl. 75-11.000.

Memorex Corporation: *See—*
Rolph, Donald L., 4,179,718, Cl. 360-99.000.

Mendenhall, Arthur L. Golf green tool. 4,179,147, Cl. 294-50.700.

Merck & Co., Inc.: *See—*
Baldwin, John J.; and Novello, Frederick C., 4,179,512, Cl. 424-273.00R.
Cohen, Edward M.; Grim, Wayne M.; Harwood, Richard J.; and Mehta, Gunvant N., 4,179,497, Cl. 424-22.000.
Johnston, David B. R., 4,179,453, Cl. 260-397.100.

Mermal, Donald J.: *See—*
Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M., 4,178,711, Cl. 43-1.000.

Mermal, Gary A.: *See—*
Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M., 4,178,711, Cl. 43-1.000.

Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M. Method for use in harvesting earthworms. 4,178,711, Cl. 43-1.000.

Mermal, Robert M.: *See—*
Mermal, Howard J.; Mermal, Gary A.; Mermal, Donald J.; and Mermal, Robert M., 4,178,711, Cl. 43-1.000.

Mersch, Roland: *See—*
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,179,275, Cl. 65-20.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, 4,179,280, Cl. 75-33.000.

Mettin, Florian: *See—*
Schmieder, Lothar; Vilgertshofer, August; and Mettin, Florian, 4,178,799, Cl. 73-141.00A.

Mettler Instrumente AG: *See—*
Kunz, Peter, 4,179,005, Cl. 177-212.000.

Mettoy Company Limited, The: *See—*
Nicholls, Mark S., 4,179,690, Cl. 340-384.00E.

Metz, Paul; Schockmel, Robert; and Mersch, Roland, to Acieries Reunies de Burbach-Eich-Dudelange S.A. Arbed. Method of expanding metallurgical slag. 4,179,275, Cl. 65-20.000.

Meyer Dairy Products Company, The: *See—*
Kawolics, Raymond P., 4,179,039, Cl. 220-319.000.

Meyer, Danny S.: *See—*
Laitkep, Anthony A.; Meyer, Danny S.; and Saka, Hamid J., 4,179,098, Cl. 251-167.000.

Meyer, Herbert: *See—*
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-27.000.

Meyer, Horst: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.

Meyer, Louis C., to Meyer, Louis C.; and Loeffler, Anna T. Split leaflet check valves. 4,178,638, Cl. 3-1.500.

Meyers, George L., to American Can Company. Display carton. 4,179,060, Cl. 229-8.000.

Mezak, John A.: *See—*
Keane, William J.; and Mezak, John A., 4,179,674, Cl. 333-204.000.

Michaylov, Ventzel G.: *See—*
Georgiev, Atanas G.; Daskalov, Hristo P.; Michaylov, Ventzel G.; and Konstantinova, Kina V., 4,179,460, Cl. 260-455.00R.

Michlmayr, Manfred J., to Chevron Research Company. Sorbent regeneration in a process for removing sulfur-containing impurities from mineral oils. 4,179,361, Cl. 208-244.000.

Michrina, Christine A.: *See—*
Esders, Theodore W.; Goodhue, Charles T.; and Michrina, Christine A., 4,179,334, Cl. 195-30.000.

Midgley, John A.; and Nyberg, David D., to Raychem Corporation. Recoverable articles. 4,179,320, Cl. 156-86.000.

Midrex Corporation: *See—*
Beggs, Donald; and Meissner, David C., 4,179,278, Cl. 75-11.000.

Mieville, Andre, to Orchimed S. A. Benzoylphenoxy propionic acid, esters thereof and pharmaceutical composition. 4,179,515, Cl. 424-278.000.

Mightly, Pamela. Comfort grip cutlery. 4,178,684, Cl. 30-344.000.

Milk Marketing Board: *See—*
Newcomb, Raymond, 4,178,936, Cl. 128-349.00B.

Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., to Mill, Kenneth G. Efficiency monitoring device. 4,179,611, Cl. 235-92.0QC.

Millard, Barry J., to Adwest Engineering Limited. Rotary valve for power-assisted steering mechanism. 4,178,835, Cl. 91-375.00A.

Miller, Clarence L., Jr., to Allegheny Ludlum Industries, Inc. Silicon steel and processing therefore. 4,179,315, Cl. 148-113.000.

Miller, Fred R. Snap ring bearing for a gun barrel bushing. 4,178,833, Cl. 89-163.000.

Miller, Gene C.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 4,179,235, Cl. 414-351.000.

Miller, Glen E.: *See—*
Latimer, John P.; Donaldson, Robert M.; Christian, Ted W.; and Miller, Glen E., 4,178,704, Cl. 37-57.000.

Miller, John H. Method and apparatus for selective recovery of metal containers. 4,179,018, Cl. 194-4.00R.

Miller, Russell C., to J. M. Eltzroth & Associates, Inc. Pigment preparation and use in coating compositions. 4,179,305, Cl. 106-292.000.

Miller, Walter E., Jr., to United States of America, Army. Optical boresight method for nutating system. 4,179,085, Cl. 244-3.110.

Milner, Burl D., to W. R. Grace & Co. Device for separating sheet bags. 4,179,055, Cl. 225-80.000.

Mimura, Yoshinori: *See—*
Imamura, Nobutake; Mimura, Yoshinori; and Kobayashi, Toshihiko, 4,179,719, Cl. 360-112.000.

Minamida, Isao: *See—*
Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu, 4,179,502, Cl. 424-246.000.

Mindermann, Fritz: *See—*
Franz, Gerhard; Halfter, Georg; Jaeckle, Walter; and Mindermann, Fritz, 4,179,476, Cl. 260-706.000.

Mine, Nobuyoshi: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.

Mineral Process Licensing Corporation B.V.: *See—*
Lumsden, John, 4,179,489, Cl. 423-79.000.

Minieri, Pasquale P.: *See—*
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.

Minnesota Mining and Manufacturing Company: *See—*
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., 4,179,050, Cl. 222-386.000.
Houghland, Stephen E., 4,179,679, Cl. 337-407.000.
Huss, Charles P., 4,179,118, Cl. 271-277.000.

Minoura, Kazuo: *See—*
Tateoka, Masamichi; and Minoura, Kazuo, 4,179,183, Cl. 350-6.100.

Miroshnichenko, Vladimir V.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M. Process for producing aniline with a permselective palladium and ruthenium catalyst. 4,179,470, Cl. 260-580.000.

Mita Industrial Co., Ltd.: *See—*
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.

Mita, Yasuhiro: *See—*
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.

Mitchell, Alfred, to Mitchell, Alfred. Floor polishing machines. 4,178,654, Cl. 15-385.000.

Mitchell, Howard E.; and Saxman, William C., to Dresser Industries, Inc. Self-cleaning raise boring head system. 4,179,000, Cl. 175-53.000.

Mitchell, Patrick J. Modular rack for displaying merchandise. 4,179,033, Cl. 211-60.00R.

Mitchell, Robert D., to Firl Industries, Inc. Pick-up nozzle. 4,179,379, Cl. 210-242.00R.

Mitsche, Roy T.; and Pope, George N., to UOP Inc. Paraffinic hydrocarbon isomerization process. 4,179,581, Cl. 585-744.000.

Mitsubishi Chemical Industries Limited: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Mitsubishi Paper Mills, Ltd.: *See—*
Miyama, Masao; Yamaguti, Sakan; and Kusama, You, 4,179,541, Cl. 428-165.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Miyamoto, Ryoichi; and Morita, Minoru, 4,179,550, Cl. 526-212.000.

Mitsui Toatsu Chemicals Incorporated: *See—*
Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, 4,179,429, Cl. 260-32.80R.

Miura, Nobuhiro: *See—*
Yanagihara, Hiromichi; and Miura, Nobuhiro, 4,178,903, Cl. 123-32.0SP.

Miura, Tatsuya: *See—*
Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, 4,179,602, Cl. 219-125.100.

Miura, Yoshimasa, to Fujitsu Limited. Magnetic recorded information reproducing apparatus. 4,179,720, Cl. 360-113.000.

Miyakawa Industry Company Limited: *See—*
Kitagawa, Toshikatsu, 4,179,229, Cl. 408-39.000.
Kitagawa, Toshikatsu, 4,179,230, Cl. 408-39.000.

Miyake, Tetsuya; Noguchi, Kohji; and Imamura, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing pyridine bases. 4,179,576, Cl. 546-251.000.

Miyama, Masao; Yamaguti, Sakan; and Kusama, You, to Mitsubishi Paper Mills, Ltd. Photographic support material and method of producing same. 4,179,541, Cl. 428-165.000.

Miyamoto, Ryoichi; and Morita, Minoru, to Mitsui Petrochemical Industries, Ltd. Method for preparing a novel polymer. 4,179,550, Cl. 526-212.000.

Miyazawa, Hiroshi, to Tokico Ltd. Mounting device for door closer. 4,179,092, Cl. 248-309.00R.

Mobay Chemical Corporation: *See—*
Carter, Russell P., Jr., 4,179,479, Cl. 525-66.000.

Mobil Oil Corporation: *See—*
Clayton, William J.; and Kutniewski, Donald F., 4,179,270, Cl. 44-40.000.
Clayton, William J., 4,179,414, Cl. 252-548.000.
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,179,392, Cl. 252-108.000.
Martinez, Carlos J., 4,179,440, Cl. 260-29.40R.

Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, to Toshiba Kikai Kabushiki Kaisha. Method for manufacturing stainless steel die cast products having low melting point. 4,178,983, Cl. 164-113.000.

Moffitt, Guy R., Jr.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.

Mole-Richardson Co.: *See—*
Aron, Daniel L., 4,179,726, Cl. 362-17.000.

Mollet, Hans: *See—*
Lacroix, Roger; and Mollet, Hans, 4,179,267, Cl. 8-41.00R.

Molt, Kenneth R., to Cincinnati Milacron Chemicals, Inc. Stabilized polypropylene compositions. 4,179,432, Cl. 260-45.75S.

Monsanto Company: *See—*
Birum, Gail H.; and Jansen, Richard F., 4,179,482, Cl. 260-941.000.
Birum, Gail H.; and Jansen, Richard F., 4,179,483, Cl. 260-941.000.
Bollinger, Frederic G.; and D'Amico, John J., 4,179,466, Cl. 260-558.00A.
Olive, Gisela; and Olive, Salvador, 4,179,462, Cl. 260-465.100.

Monsheimer, Rolf: *See—*
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.

Montecchi, Lauretta: *See—*
Marchi, Egidio; and Montecchi, Lauretta, 4,179,438, Cl. 260-239.30P.

Montedison S.p.A.: *See—*
Cau, Pasqualino; and Cocca, Vincenzo, 4,179,307, Cl. 134-58.00D.

Montusi, Robert R., to Grumman Aerospace Corporation. Dual scavenging separator. 4,179,273, Cl. 55-457.000.

Mookherjee, Braja D.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.

Moon, William F. Respirator filter and method of making the same. 4,179,274, Cl. 55-524.000.

Moore, J. Kenneth; Kaiser, Arthur; and Mahler, Henry W., to CBS Inc. Television system for displaying and recording paths of motion. 4,179,704, Cl. 358-22.000.

Moore, Joseph E., to Chevron Research Company. Fungidal and herbicidal 2-substituted-3-oxa-3aλ^4, 4-dithia-6-halo-1,5-diazapentalene. 4,179,441, Cl. 548-122.000.

Moore, Karen H.: *See—*
Moore, Marvin L.; Moore, Karen H.; and Moore, William M., 4,178,964, Cl. 137-625.400.

Moore, Marvin L.; Moore, Karen H.; and Moore, William M. Double valve mechanism for controlling fluid flows. 4,178,964, Cl. 137-625.400.

Moore, Paul B.: *See—*
Swenson, Paul F.; and Moore, Paul B., 4,178,772, Cl. 62-238.000.

Moore, William M.: *See—*
Moore, Marvin L.; Moore, Karen H.; and Moore, William M., 4,178,964, Cl. 137-625.400.

Morawski, Janus. Roofing ladder and braces therefor. 4,179,011, Cl. 182-45.000.

Mori, Fumio: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Morimoto, Yoshio: *See—*
Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, 4,179,429, Cl. 260-32.80R.

Morishita, Taneji, to Konishiroku Photo Industry Co., Ltd. Device for loading a paper roll. 4,179,077, Cl. 242-55.000.

Morita, Minoru: *See—*
Miyamoto, Ryoichi; and Morita, Minoru, 4,179,550, Cl. 526-212.000.

Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, to Mitsubishi Chemical Industries Limited. Amino acid derivatives of 6-(2-amino-2-arylacetamido) penicillanic acids. 4,179,437, Cl. 260-239.100.

Moritz, Holger, to International Business Machines Corporation. Method and system for in situ control of material removal processes. 4,179,622, Cl. 250-571.000.

Morooka, Shigeaki: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.

Morrison, Bert L.: *See—*
Kemp, Willard E.; and Morrison, Bert L., 4,178,665, Cl. 29-157.10R.

Morse, Milton. Toggle switch seal. 4,178,806, Cl. 74-17.800.

Morville, Malcolm: *See—*
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,520, Cl. 424-309.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,521, Cl. 424-309.000.

Moschetti, Armando, to Siargas — Societa' Italiana Assistenza Reti Gas S.p.A. Apparatuses for producing tight joints or seals in underground pipelines. 4,178,875, Cl. 118-712.000.

Mosser, Jacqueline: *See—*
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.

Mostek Corporation: *See—*
Athanas, Terry G., 4,179,311, Cl. 148-1.500.

Mougin, Georges L., to ITI Limited. Member for attaching a propulsion unit to a tabular iceberg. 4,178,872, Cl. 115-72.000.

Moyer, Paul W.: *See—*
Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., 4,179,032, Cl. 209-538.000.

Mueller, Christine E.: *See—*
Mueller, William F., 4,178,970, Cl. 139-30.000.

Mueller, William F., to Mueller, Christine E. Hand loom. 4,178,970, Cl. 139-30.000.

Mukhin, Anatoly A.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Muller, Karl: *See—*
Weigel, Horst; and Muller, Karl, 4,179,284, Cl. 75-92.000.

Muller, Klaus: *See—*
Schnellbacher, Kurt; Muller, Klaus; and Gorlitz, Frank-Otto, 4,179,363, Cl. 209-481.000.

Multinorm, B.V.: *See—*
Oosterling, Pieter A.; and Vissers, Hermanus H., 4,179,073, Cl. 239-659.000.

Murakami, Tomomi; and Ichikawa, Singo, to Citizen Watch Company Limited. Control circuit for electronic timepiece. 4,178,750, Cl. 58-4.00A.

Murakita, Seiichi; Ohta, Akio; and Narahara, Satoshi, to Sumitomo Metal Mining Company Limited. Method for removing As, or As and Sb and/or Bi from sulfuric acid. 4,179,495, Cl. 423-531.000.

Murata Manufacturing Co., Ltd.: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,179,673, Cl. 333-204.000.

Murdy, Raymond R.: *See—*
Van Antwerp, Ferne; and Murdy, Raymond R., 4,179,034, Cl. 414-551.000.

Murray, Edward C., to Kerr-McGee Corporation. Copper casting method using titanium dioxide release method. 4,178,981, Cl. 164-72.000.

Murray, Pat L.: *See—*
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,179,094, Cl. 249-82.000.

Muto, Nobuyoshi; Matsuda, Yasuo; and Honda, Kazuo, to Hitachi, Ltd. Control device for a pulse-width modulated inverter. 4,179,727, Cl. 363-41.000.

N L Industries, Inc.: *See—*
Koch, James H.; and Ritzenthaler, Richard A., 4,179,313, Cl. 148-3.000.

N. V. Optische Industrie "De Oude Delft": *See—*
van der Does, Lucas, 4,179,114, Cl. 271-19.000.

Naamloze Vennootschap Declametaal: *See—*
De Gryse, Jean-Claude, 4,178,845, Cl. 100-11.000.

Nabisco, Inc.: *See—*
White, E. Gurney, deceased, 4,179,527, Cl. 426-620.000.

Nadelson, Jeffrey, to Sandoz, Inc. Substituted hydroxy pyridones. 4,179,566, Cl. 546-116.000.

Nagai, Akinori, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Plugging meter. 4,178,795, Cl. 73-61.0LM.

Naganuma, Susumu: *See—*
Ogiwara, Kenzyu; Inoue, Hisao; and Naganuma, Susumu, 4,179,237, Cl. 415-1.000.

Nagel, Dieter H.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,178,976, Cl. 150-0.500.

Nagumo, Fumio, to Sony Corporation. Defect noise compensating system. 4,179,711, Cl. 358-213.000.

Nakada, Akira: *See—*
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.

Nakagami, Tatsuro: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Nakahara, Shohei: *See—*
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.

Nakajima, Fumio: *See—*
Yoshida, Hirohiko; and Nakajima, Fumio, 4,179,671, Cl. 331-116.0FE.

Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,178,889, Cl. 123-75.00B.

Nakamura, Hisatsugu: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.

Nakamura, Shizuo: *See—*
Nakazono, Akio; and Nakamura, Shizuo, 4,179,721, Cl. 360-137.000.

Nakamura, Takashi: *See—*
Ono, Katsuya; Nakamura, Takashi; and Wakabayashi, Toru, 4,179,281, Cl. 75-35.000.

Nakao, Toshiaki: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.

Nakauchi, Shunsaku; and Takahashi, Akifusa, to Security Patrols Co., Ltd.; and Kokusai Gijutsu Kaihatsu Co., Ltd. Flame sensor. 4,179,606, Cl. 250-339.000.

Nakayama, Junichi: *See—*
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.

Nakazono, Akio; and Nakamura, Shizuo, to Shin-Shirasuna Electric Corporation. Tape recorder having playback retaining mechanism. 4,179,721, Cl. 360-137.000.

Nalco Chemical Company: *See—*
Bradley, Robert L.; and Mauceri, Frank A., 4,179,369, Cl. 210-43.000.
Broersma, Frank R.; and Choca, Monica E., 4,179,411, Cl. 252-465.000.
Gabel, Robert K.; Lindenberger, William H.; and Pavilcius, Audrone M., 4,179,396, Cl. 252-329.000.
Phillips, Kenneth G.; Ballweber, Edward G.; and Hurlock, John R., 4,179,424, Cl. 260-29.4UA.
Svarz, Jerry J., 4,179,329, Cl. 162-29.000.

Nangeroni, John A.: *See—*
Dodson, George B.; and Nangeroni, John A., 4,179,669, Cl. 330-282.000.

Napolitano, Joseph J.; and Richardson, Michael, to Auto Research Corporation. Resettable pressure responsive valve. 4,178,960, Cl. 137-494.000.

Narahara, Satoshi: *See—*
Murakita, Seiichi; Ohta, Akio; and Narahara, Satoshi, 4,179,495, Cl. 423-531.000.

Narvaez, Peter D.: *See—*
Brown, Floyd P.; and Narvaez, Peter D., 4,179,748, Cl. 364-900.000.

Nash, John E., to Star Dental Manufacturing Co., Inc. Dental burr. 4,178,689, Cl. 433-166.000.

National Advanced Drilling Machines, Inc.: *See—*
Bromell, Raymond J.; and Sideris, John N. J., 4,179,233, Cl. 414-139.000.

National Controls, Inc.: *See—*
Ebbinge, Willem, 4,179,004, Cl. 177-211.000.

National Research Development Corporation: *See—*
Dombrowski, Norman, 4,179,068, Cl. 239-13.000.
Howe, Arthur T.; and Shilton, Mark G., 4,179,491, Cl. 423-253.000.

National Semiconductor Corporation: *See—*
Brown, Floyd P.; and Narvaez, Peter D., 4,179,748, Cl. 364-900.000.
Compton, James B.; Cometta, Robert A.; and Culmer, Daniel D., 4,179,310, Cl. 148-1.500.

Nau, Paul R., to Briggs & Stratton Corporation. Nonpolluting liquid fuel system for engines. 4,178,894, Cl. 123-119.00B.

Nauroth, Peter: *See—*
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.

NCR Corporation: *See—*
Ward, Stephen W., 4,179,031, Cl. 209-534.000.

Necchi, S.p.A.: *See—*
Bianchi, Nereo; and Zatti, Piergentino, 4,178,862, Cl. 112-121.110.

Neefe, Charles W. Method of making toric lenses. 4,179,484, Cl. 264-1.000.

Nelson, Arthur R., to Sperry Rand Corporation. Electrooptical modulator. 4,179,184, Cl. 350-96.140.

Nelson, Benjamin R.: *See—*
Ketterling, Edwin; and Nelson, Benjamin R., 4,178,757, Cl. 60-548.000.

Nelson, Linnea E.; and Reineke, Charles E., to Dow Chemical Company, The. Flame retardant intumescent polyamides. 4,179,298, Cl. 106-18.210.

Nelson, Peter F.: *See—*
Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, 4,178,861, Cl. 162-72.000.

Nemeth, Suzette B., to Avery International Corporation. Extractive transfer diaper tab means. 4,178,933, Cl. 128-284.000.

Neoloy Products, Inc.: *See—*
Prosen, Emil M., 4,179,288, Cl. 75-172.00G.

Neteler, Bernhard: *See—*
Kollensperger, Friedrich-Gero; Hartleben, York; Kretzschmar, Rolf; and Neteler, Bernhard, 4,179,442, Cl. 548-232.000.

Neuendorff, Hans, to Siemens Aktiengesellschaft. Circuit for varying an operating voltage of a deflection amplifier of a magnetodynamic deflection system. 4,179,643, Cl. 315-411.000.

Newcomb, Raymond, to Milk Marketing Board. Apparatus for use in collecting eggs from animals. 4,178,936, Cl. 128-349.00B.

Newkirk, David D.; Thir, Basil; and Login, Robert B., to BASF Wyandotte Corporation. Fiber finish compositions. 4,179,544, Cl. 428-395.000.

Newman, John W., to Allied Piping Products Company, Inc. Branch connection fitting. 4,179,141, Cl. 285-189.000.

Nichi-Ei Bussan Co., Ltd.: *See—*
Hara, Kunio; and Yoshida, Kohsaku, 4,178,669, Cl. 29-412.000.

Nicholls, Mark S., to Mettoy Company Limited, The. Two-tone audible warning circuits. 4,179,690, Cl. 340-384.00E.

Nicklas, Walter; Hesler, Dietrich; and Gresser, Gerhard, to Karl M. Reich Maschinenfabrik GmbH, Firma. Apparatus for melting and applying a fusion adhesive. 4,178,876, Cl. 118-681.000.

Nihon Denshi Kabushiki Kaisha: *See—*
Watanabe, Hisao; and Etoh, Terukazu, 4,179,605, Cl. 250-311.000.

Niles Parts Co., Ltd.: *See—*
Yamamoto, Harushige, 4,178,802, Cl. 73-313.000.

Nippon Electric Co., Ltd.: *See—*
Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, 4,179,710, Cl. 358-135.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Aoki, Eiichiro; and Yamada, Shigeru, 4,178,824, Cl. 84-1.190.
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.

Nippon Jiryoku Senko Co., Ltd.: *See—*
Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, 4,179,279, Cl. 75-24.000.

Nippon Kogaku K. K.: *See—*
Hashimoto, Hiroshi, 4,178,720, Cl. 51-124.00L.

Nippon Kogaku K.K.: *See—*
Fukuhara, Toru, 4,179,202, Cl. 354-43.000.

Nippon Steel Corporation: *See—*
Ono, Katsuya; Nakamura, Takashi; and Wakabayashi, Toru, 4,179,281, Cl. 75-35.000.

Nippondenso Co., Ltd.: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, 4,178,884, Cl. 123-32.0EE.

Nishida, Takashi: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Nishikaiji, Yuji: *See—*
Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, 4,179,602, Cl. 219-125.100.

Nishikawa, Masanori; and Hattori, Masao, to Yoshino Kogyosho Co., Ltd. Method of making a frosted bottle of saturated polyester. 4,179,488, Cl. 264-521.000.

Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, to Murata Manufacturing Co., Ltd. Interdigital filter. 4,179,673, Cl. 333-204.000.

Nishikawa, Yasuo: *See—*
Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, 4,179,496, Cl. 423-598.000.

Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, to Sony Corporation. Color camera system. 4,179,706, Cl. 358-44.000.

Nishiwaki, Kiyoshi: *See—*
Konishi, Hiromu; and Nishiwaki, Kiyoshi, 4,179,164, Cl. 303-24.00F.

Nishizaki, Shinzo: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,179,584, Cl. 179-1.0SM.

Nissan Motor Company, Limited: *See—*
Gotoh, Miyuki; and Ogawa, Mikiyoshi, 4,178,969, Cl. 139-1.00R.
Ito, Akira; and Matsui, Masao, 4,178,994, Cl. 169-52.000.

Nitelea, Ion: *See—*
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, 4,179,439, Cl. 260-239.30P.

Nitsch, Edward J., to R. E. Dietz Co. Signal switch assembly. 4,179,592, Cl. 200-61.270.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,179,084, Cl. 242-212.000.

Nogami, Akira: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.

Noguchi, Kohji: *See*—
Miyake, Tetsuya; Noguchi, Kohji; and Imamura, Kazuo, 4,179,576, Cl. 546-251.000.

Nohira, Hidetaka: *See*—
Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, 4,178,896, Cl. 123-119.00A.

Norimatsu, Hideaki; Kobayashi, Akio; Masuda, Akira; and Kitajima, Sigenori, to Nippondenso Co., Ltd. Method and system to control the mixture air-to-fuel ratio. 4,178,884, Cl. 123-32.0EE.

Novello, Frederick C.: *See*—
Baldwin, John J.; and Novello, Frederick C., 4,179,512, Cl. 424-273.00R.

Nowak, Edward J.: *See*—
Isaac, L. Henry; Nowak, Edward J.; and Schmitz, Charles R., 4,179,168, Cl. 312-125.000.

Nowicki, Erwin K.: *See*—
Child, James L., Jr.; Fouss, James L.; and Nowicki, Erwin K., 4,179,227, Cl. 405-182.000.

Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., to Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt". Raw mixture for the production of cement clinker. 4,179,302, Cl. 106-100.000.

Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu. 7[2-Hydroxyiminoacetamido]cephalosporins. 4,179,502, Cl. 424-246.000.

Nussbaumer, Thomas, to Patent & Inventions Ltd. Seal arrangements. 4,179,131, Cl. 277-165.000.

Nusser, Josef. Apparatus for agricultural machines. 4,178,942, Cl. 130-23.000.

NUTRO Patentverwertungs- und Maschinenhandels-GmbH: *See*—
Grocke, Diethelm W. K.; and Wittmann, Klaus, 4,179,022, Cl. 198-437.000.

Nyberg, David D.: *See*—
Midgley, John A.; and Nyberg, David D., 4,179,320, Cl. 156-86.000.

Nyeki nee Kuprina, Olga: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.

O&K Orenstein & Koppel Aktiengesellschaft: *See*—
Heusler, Helmut; and Behle, Fritz, 4,179,020, Cl. 198-326.000.

Oatey Co.: *See*—
Hayes, Robert R., 4,178,663, Cl. 29-78.000.

Oberbeck, George A.: *See*—
Stanton, William E.; Eisenhaure, David B.; Oberbeck, George A.; and Fertig, Kenneth, 4,179,729, Cl. 363-175.000.

Oberster, Arthur E.: *See*—
Cheng, Tai C.; Fieldhouse, John W.; Oberster, Arthur E.; and Graves, Daniel F., 4,179,555, Cl. 528-168.000.

Oce-van der Grinten N.V.: *See*—
Breuers, Theo P. C.; and Joosten, Joannes J. W. M., 4,179,112, Cl. 271-3.000.

Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, to Chugai Seiyaku Kabushiki Kaisha. 3α,6α-Dihydroxy-5β-cholestan-24-one derivatives and process for preparing the same. 4,179,452, Cl. 260-397.200.

Odermann, Charles R.; and Johnson, Ralph E., to Singer Company, The. Finger guard for sewing machines. 4,178,865, Cl. 112-261.000.

Odetics, Inc.: *See*—
Bartholet, Stephen J., 4,179,597, Cl. 219-56.100.

Oehler, Harry G., to Westinghouse Electric Corp. Sense circuit for use in variable threshold transistor memory arrays. 4,179,626, Cl. 307-238.000.

O'Farrell, Charles P.: *See*—
Makowski, Henry S.; and O'Farrell, Charles P., 4,179,422, Cl. 260-28.50B.

Ogawa, Hiroshi: *See*—
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, 4,179,116, Cl. 271-306.000.

Ogawa, Mikiyoshi: *See*—
Gotoh, Miyuki; and Ogawa, Mikiyoshi, 4,178,969, Cl. 139-1.00R.

Ogiwara, Kenzyu; Inoue, Hisao; and Naganuma, Susumu, to Hitachi, Ltd. Method for controlling the operation of a fluid machine in spinning reserve. 4,179,237, Cl. 415-1.000.

O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, to UOP Inc. Hydrocracking with catalyst modified by Group IIA. 4,179,356, Cl. 208-111.000.

O'Hara, Mark J.; and Johnson, Russell W., to UOP Inc. Selective hydrocracking process for middle distillate. 4,179,357, Cl. 208-111.000.

Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, to Sanyo Electric Co., Ltd. Flip-flop having reset preferential function. 4,179,628, Cl. 307-279.000.

Ohinouye, Tsuneo: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.

Ohloff, Gunther: *See*—
Schulte-Elte, Karl-Heinrich; Fankhauser, Peter; and Ohloff, Gunther, 4,179,448, Cl. 260-346.110.

Ohnishi, Takashi: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Ohta, Akio: *See*—
Murakita, Seiichi; Ohta, Akio; and Narahara, Satoshi, 4,179,495, Cl. 423-531.000.

Ohya, Junichi: *See*—
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.

Okami, Yoshiro: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.

O'Leary, George P., to Floating Point Systems, Inc. Floating point data processor having fast access memory means. 4,179,734, Cl. 364-200.000.

Oleinik, Vladimir T.: *See*—
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Olin Corporation: *See*—
Popplewell, James M., 4,178,990, Cl. 165-134.00R.
Rothgery, Eugene F.; and Schroeder, Hansjuergen A., 4,179,559, Cl. 544-237.000.

Olive, Gisela; and Olive, Salvador, to Monsanto Company. Process for preparing acetonitrile. 4,179,462, Cl. 260-465.100.

Olive, Salvador: *See*—
Olive, Gisela; and Olive, Salvador, 4,179,462, Cl. 260-465.100.

Oliveira, Joseph P., II. Encoder unit for mobile radio transmitter. 4,179,588, Cl. 179-90.00K.

Ollivier, Christian: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

Olney, Alvin A.; and Olney, Rachel I. Method and apparatus for introducing and distributing food additives in meats. 4,178,660, Cl. 17-42.100.

Olney, Rachel I.: *See*—
Olney, Alvin A.; and Olney, Rachel I., 4,178,660, Cl. 17-42.100.

Olsen, Gregory H.; and Ettenberg, Michael, to RCA Corporation. Low cost high efficiency gallium arsenide homojunction solar cell incorporating a layer of indium gallium phosphide. 4,179,308, Cl. 136-89.0GA.

Olsen, Robert: *See*—
Hallock, Edward C.; Olsen, Robert; and Ennesser, George, 4,178,738, Cl. 52-663.000.

Olson, Daniel R.: *See*—
Schroeter, Siegfried H.; and Olson, Daniel R., 4,179,548, Cl. 525-329.000.

Olympus Optical Company, Ltd.: *See*—
Kobayashi, Minoru, 4,179,714, Cl. 360-61.000.
Satoh, Ken; and Yanagida, Tuneo, 4,179,716, Cl. 360-74.300.
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.
Suzuki, Takeomi; and Hayashi, Asao, 4,179,743, Cl. 364-518.000.
Tsunefuji, Katsuhiko, 4,179,593, Cl. 200-292.000.

O'Maley, James B., to Abbott Coin Counter Company, Inc. Automatic currency identification system. 4,179,685, Cl. 340-146.30H.

Omata, Kenzo: *See*—
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.

Omnewtronics, Inc.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,178,897, Cl. 123-122.00E.

Omnipure, Inc.: *See*—
Krause, William A.; and Shea, Evan P., 4,179,347, Cl. 204-149.000.

Omura, Yoshiaki: *See*—
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.

Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Amino acid derivatives. 4,179,434, Cl. 260-112.50R.

Onishi, Hiroyasu: *See*—
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, 4,179,624, Cl. 307-3.000.

Onizuka, Shigenori: *See*—
Inaba, Hideya; Kamino, Yasumi; Onizuka, Shigenori; and Inazumi, Chikashi, 4,179,412, Cl. 252-4^{1}/2.000.

Ono, Katsuya; Nakamura, Takashi; and Wakabayashi, Toru, to Nippon Steel Corporation. Method for cooling high-temperature reduced iron. 4,179,281, Cl. 75-35.000.

Oosterling, Pieter A.; and Vissers, Hermanus H., to Multinorm, B.V. Driving unit for an oscillating spreading pipe of a device for distributing material. 4,179,073, Cl. 239-659.000.

Ootsubo, Suminobu: *See*—
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.

Opelt, Christian, to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. System for electronic editing of tape. 4,179,712, Cl. 360-14.000.

Oppolzer, Wolfgang, to CHON Corporation. Trans-N-acyl-N-alkyl-1-amino-1,3-butadienes and trans-N-acyl-N-aryl-1-amino-1,3,-butadienes. 4,179,572, Cl. 560-115.000.

Orain, Michel, to Glaenzer Spicer. Homokinetic joint of the tripod type. 4,178,778, Cl. 64-21.000.

Orchimed S. A.: *See*—
Mieville, Andre, 4,179,515, Cl. 424-278.000.

Orova, Josef: *See*—
Podrapsky, Jiri; and Orova, Josef, 4,178,892, Cl. 123-117.00R.

Ortec Incorporated: *See—*
Bedwell, Michael O., 4,179,664, Cl. 328-150.000.
Ortiz, Jose E. Light shade mountable in a plurality of positions on a plurality of items in an automobile. 4,179,155, Cl. 296-97.00C.
Ortmanns, Gunther; Kraemling, Franz; and Pikhard, Siegfried, to Saint-Gobain Industries. Fire-proof window. 4,178,728, Cl. 52-232.000.
Osaka University, President of: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,179,557, Cl. 544-28.000.
Osaki Electric Co., Ltd.: *See—*
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, 4,179,624, Cl. 307-3.000.
Osborn, Norbert L., to WRR Industries, Inc. Turbocharger having variable area turbine nozzles. 4,179,247, Cl. 417-406.000.
Ostbo, Nils. Furnace. 4,178,880, Cl. 122-182.00S.
Osterhus, Steven J.: *See—*
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.
Otaka, Syoichi: *See—*
Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, 4,178,890, Cl. 123-103.00R.
Otto, Robert B.: *See—*
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., 4,179,050, Cl. 222-386.000.
Oude Alink, Bernardus A., to Petrolite Corporation. Pyridines and dihydropyridines. 4,179,570, Cl. 546-252.000.
Outboard Marine Corporation: *See—*
Hines, Charles E.; and Williams, Dwight E., 4,178,860, Cl. 111-7.000.
Owen, Leonard J.: *See—*
Collier, John C.; and Owen, Leonard J., 4,178,973, Cl. 140-123.600.
Owen, William H., III: *See—*
Liu, Sheau-Ming S.; Owen, William H., III; and Pashley, Richard D., 4,178,674, Cl. 29-571.000.
Owens-Corning Fiberglas Corporation: *See—*
Shannon, Richard F., 4,179,303, Cl. 106-119.000.
Oxy Metal Industries Corporation: *See—*
Tremmel, Robert A., 4,179,343, Cl. 204-43.00T.
P. R. Mallory & Co. Inc.: *See—*
Ciliberti, Frank L., Jr., 4,179,545, Cl. 429-65.000.
Pacitti, William: *See—*
Shoemaker, Edwin J.; Pacitti, William; and Baumann, Marvin J., 4,179,157, Cl. 297-83.000.
Package Machinery Company: *See—*
Groom, James S.; and Prince, Clarence F., 4,178,740, Cl. 53-556.000.
Page, Robert E. Apparatus for handling web material, and method. 4,179,330, Cl. 162-113.000.
Page, William R.; and Rees, James G. Modulating valve assembly for railroad car brake cylinders. 4,179,165, Cl. 303-59.000.
Pagels, Louis T.: *See—*
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., 4,178,976, Cl. 150-0.500.
Pako Corporation: *See—*
Pone, John, Jr., 4,179,214, Cl. 355-35.000.
Palau, Joseph, to Societe Anonyme des Etablissements Staubli. Non-return devices for welding installations. 4,178,958, Cl. 137-460.000.
Palczuk, Nicholas C.: *See—*
Davis, Frank F.; Van Es, Theodorus; and Palczuk, Nicholas C., 4,179,337, Cl. 435-181.000.
Palosi, Eva: *See—*
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
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Pampouchidis, Georgios; and Honig, Helmut, to Vianova Kunstharz, A.G. Self-crosslinking cationic polyurethane based electrodepositable binders. 4,179,425, Cl. 260-29.6NR.
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Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.
Panther Machine Corp.: *See—*
Grimm, Harold; and Zuckerman, Ira, 4,179,108, Cl. 270-31.000.
Parbuzina, Iraida L.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.
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Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M., 4,178,935, Cl. 128-328.000.
Park, Jang Y., to United States of America, Energy. Portable probe to measure sensitization of stainless steel. 4,179,349, Cl. 204-195.00R.
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Alessio, Attilio; Parpaiola, Carlo; and Antonio, Pier, 4,179,598, Cl. 219-79.000.
Parr, Guy H., Jr. Apertured panel corner mount fastener for concrete walls. 4,179,089, Cl. 248-216.100.
Parry, John C. Apparatus for application of plastics stretch films. 4,179,081, Cl. 242-99.000.
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Liu, Sheau-Ming S.; Owen, William H., III; and Pashley, Richard D., 4,178,674, Cl. 29-571.000.
Pasini, Luciano, to Alfa Romeo S.p.A. Motor vehicle fuel tank. 4,179,036, Cl. 220-22.000.
Pasztor, Gabriel: *See—*
Dustmann, Cord-Henrich; Schmidt, Curt; and Pasztor, Gabriel, 4,178,676, Cl. 29-599.000.
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Taylor, Glenn N.; and Patel, Bhupendra C., 4,178,937, Cl. 128-349.00B.
Patel, Ghanshyam C., to Chicago Pneumatic Tool Company. Thread construction for rotary worm compression-expansion machines. 4,179,250, Cl. 418-195.000.
Patels, Gottfried: *See—*
Freudenschuss, Otto; Keznickl, Eduard; and Patels, Gottfried, 4,179,191, Cl. 350-187.000.
Patent & Inventions Ltd.: *See—*
Nussbaumer, Thomas, 4,179,131, Cl. 277-165.000.
Patnaude, Henry A. Dolly. 4,179,080, Cl. 242-86.520.
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Evans, Gregory W.; and Paul, James E., 4,179,693, Cl. 343-5.0MM.
Pauliukonis, Richard S. Internally piloted reversing valve for heat pump. 4,178,768. Cl. 62-160.000.
Paull, Peter L.; and McGann, Rodney, to Texaco Inc. Partial oxidation process. 4,178,758, Cl. 60-648.000.
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Gabel, Robert K.; Lindenberger, William H.; and Pavilcius, Audrone M., 4,179,396, Cl. 252-329.000.
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Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,402, Cl. 252-431.00C.
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Christofas, Alkis; and Dohany, Julius E., 4,179,542, Cl. 428-324.000.
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Feldman, Edward; and Guenther, Heinz R., 4,179,224, Cl. 400-637.000.
Hall, Lawrence G., 4,178,919, Cl. 128-719.000.
Shafer, David R., 4,179,192, Cl. 350-294.000.
Perkins, Norman P., Jr., to Gould Inc. Trip bar means subassembly. 4,179,675, Cl. 335-9.000.
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Jung, Fritz; and Kwech, Ludwig, 4,179,263, Cl. 432-1.000.
Peroxid-Chemie GmbH: *See—*
Dillenburg, Helmut; Dotsch, Werner; and Siegel, Rudolf, 4,179,394, Cl. 252-186.000.
Perreault, Richard, to Gould Inc. Electric fuse with gas evolving materials. 4,179,678, Cl. 337-293.000.
Perreault, Richard J.: *See—*
Kozacka, Frederick J.; and Perreault, Richard J., 4,179,677, Cl. 337-161.000.
Persoons, Gustaaf M.; and Wijts, Corneel C., to FMC Corporation. Harvester air separator. 4,178,743, Cl. 56-12.900.
Persson, Staffan B.; and Tackaberry, Robert B., to American Optical Corporation. Compact subjective refractive instrument. 4,179,196, Cl. 351-30.000.
Petersson, Bengt O., to Bengt Petersson New Products Investment AB. Roof covering. 4,178,731, Cl. 52-520.000.
Petroleum Designers, Inc.: *See—*
Pierce, Elwood K., Jr., 4,179,099, Cl. 251-168.000.
Petrolite Corporation: *See—*
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,179,549, Cl. 525-374.000.
Cheng, William J.; and Guthrie, David B., 4,179,383, Cl. 252-25.000.
Oude Alink, Bernardus A., 4,179,570, Cl. 546-252.000.
Pfaffle, Ernst, to Hans Sickinger Co. Machine for manufacturing zig zag wire binders. 4,178,972, Cl. 140-105.000.
Pfizer Inc.: *See—*
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,520, Cl. 424-309.000.
Barnish, Ian T.; Cross, Peter E.; Danilewicz, John C.; and Morville, Malcolm, 4,179,521, Cl. 424-309.000.
Barth, Wayne E., 4,179,511, Cl. 424-271.000.
Pflasterer, Peter W., to Masco Corporation of Indiana. Multiband scanning radio receiver using frequency synthesizer. 4,179,662, Cl. 325-470.000.
Pfleger, Frederick W. Apparatus for closing and opening the threaded necks of containers. 4,178,732, Cl. 53-309.000.
Pfleiderer, Ernst: *See—*
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.
Phelps, Dennis B.: *See—*
Buechler, Ulrich H.; Phelps, Dennis B.; and Boswick, John A., Jr., 4,178,640, Cl. 3-1.910.
Philip Morris Incorporated: *See—*
Knight, Jack B., 4,178,946, Cl. 131-135.000.

Phillips, E. W. Daylight loader cover device for photographic printing machine. 4,179,207, Cl. 354-308.000.

Phillips, Howard C., to AMP Incorporated. Applicator for telephone connectors. 4,178,675, Cl. 29-566.100.

Phillips, Kenneth G.; Ballweber, Edward G.; and Hurlock, John R., to Nalco Chemical Company. Method for rapidly producing amino methylated polymers and quaternary ammonium salts thereof. 4,179,424, Cl. 260-29.4UA.

Phillips Petroleum Company: *See—*
Brady, Donnie G., 4,179,571, Cl. 560-64.000.
Cobb, Raymond L.; and Fodor, Lawrence M., 4,179,471, Cl. 585-452.000.
Cobb, Raymond L., 4,179,472, Cl. 585-452.000.
Cobb, Raymond L., 4,179,580, Cl. 546-349.000.
Hsieh, Henry L., 4,179,480, Cl. 525-99.000.
Hutson, Thomas, Jr.; and Farha, Floyd E., Jr., 4,179,353, Cl. 208-65.000.
Makovec, Donald J.; and Haskell, Donald M., 4,179,475, Cl. 585-714.000.

Pickett, Carl M. Seed spreader. 4,179,048, Cl. 222-44.000.

Pierce, Elwood K., Jr., to Petroleum Designers, Inc. Expanding gate valve. 4,179,099, Cl. 251-168.000.

Piette, Remi R.; and Hubert, Francois M. A., to Tissmetal Lionel-Dupont. Conveyor systems utilizing a chain drive means. 4,179,025, Cl. 198-833.000.

Pikhard, Siegfried: *See—*
Ortmanns, Gunther; Kraemling, Franz; and Pikhard, Siegfried, 4,178,728, Cl. 52-232.000.

Pirkle, Sherman J., to Hewlett-Packard Company. Capacitor charging circuit. 4,179,728, Cl. 363-59.000.

Pischikov, Sergei I.: *See—*
Antonov, Boris M.; Vasiliev, Viktor V.; and Pischikov, Sergei I., 4,179,730, Cl. 364-105.000.

Pitha, Carl A.: *See—*
Friedman, Jerome D.; and Pitha, Carl A., 4,179,190, Cl. 350-152.000.

Pitney-Bowes, Inc.: *See—*
Dlugos, Daniel F., 4,179,747, Cl. 364-900.000.

Pittet, Alan O.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.

Pivovarov, Anatoly D.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Plessey Handel und Investments AG: *See—*
Alder, Christopher J., 4,179,694, Cl. 343-5.0AF.

Podgursky, Alfred M.: *See—*
Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M., 4,178,935, Cl. 128-328.000.

Podrapsky, Jiri; and Orova, Josef, to Robert Bosch GmbH. Speed-dependent ignition time advancement apparatus in magneto generator ignition systems. 4,178,892, Cl. 123-117.00R.

Polanin, Walter R. Removing post from human bony structure. 4,178,688, Cl. 433-220.000.

Polaroid Corporation: *See—*
Finnemore, Fred M.; and Goodwin, Robert A., 4,179,205, Cl. 354-145.000.
Land, Edwin H., 4,179,199, Cl. 352-138.000.

Poletto, John F.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.

Pollack, Jack, to Chicago Bridge & Iron Company. Mooring line handling apparatus. 4,178,870, Cl. 114-230.000.

Pollitzer, Ernest L.: *See—*
Hayes, John C.; and Pollitzer, Ernest L., 4,179,359, Cl. 208-139.000.

Pols, Sidney. Shoe to be worn over cast. 4,178,703, Cl. 36-110.000.

Polyakova, Viktoria P.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Polychrome Corporation: *See—*
Rossomando, Robert, 4,179,304, Cl. 106-177.000.

Polygram GmbH: *See—*
Soeding, Horst, 4,179,532, Cl. 427-54.100.

Polysar Limited: *See—*
Edwards, Douglas C.; and Sato, Kyosaku, 4,179,421, Cl. 260-23.70M.

Pone, John, Jr., to Pako Corporation. Photographic printer control system. 4,179,214, Cl. 355-35.000.

Ponsford, Roger J., to Beecham Group Limited. 2,4-Diamino-5-alkyloxy-pyrimidines. 4,179,562, Cl. 544-298.000.

Ponzellini, Giulio, to Anonima Castelli S.p.A. Disassemblable table. 4,178,858, Cl. 108-150.000.

Pope, George N.: *See—*
Mitsche, Roy T.; and Pope, George N., 4,179,581, Cl. 585-744.000.

Popplewell, James M., to Olin Corporation. Solar energy collector system. 4,178,990, Cl. 165-134.00R.

Portex, Inc.: *See—*
Stephens, Thomas P., 4,178,939, Cl. 128-207.150.

Posakony, Gerald J.: *See—*
Hildebrand, B. Percy; and Posakony, Gerald J., 4,179,683, Cl. 367-138.000.

Potter, Peter N., to Solartron Electronic Group Limited, The. Pressure transducers. 4,178,804, Cl. 73-702.000.

Powell Manufacturing Company, Inc.: *See—*
Wilson, Robert W., 4,178,745, Cl. 56-27.500.

Prat, Gisele: *See—*
Fauran, Francois; Feniou, Claude; Mosser, Jacqueline; and Prat, Gisele, 4,179,519, Cl. 424-308.000.

Pratt, Harry H.; and Cranstoun, David, to Foster Wheeler Energy Corporation. Vapor generating system utilizing angularly arranged bifurcated furnace boundary wall fluid flow tubes. 4,178,881, Cl. 122-235.00A.

Prestholdt, Ogden L. Method and apparatus for controlling electromagnetic reradiation from an electrically conducting structure. 4,179,700, Cl. 343-885.000.

Prince, Clarence F.: *See—*
Groom, James S.; and Prince, Clarence F., 4,178,740, Cl. 53-556.000.

Procter & Gamble Company, The: *See—*
Rudkin, Arthur L.; Clint, John H.; and Young, Kenneth, 4,179,382, Cl. 252-8.800.
Spadini, Gianfranco L.; and Tolliday, Ian D., 4,179,390, Cl. 252-95.000.

Prosen, Emil M., to Neoloy Products, Inc. Palladium base dental alloy. 4,179,288, Cl. 75-172.00G.

Prusinski, Richard C.; and Johnson, Timothy E., to Architectural Research Corporation. Heat absorbing panel. 4,178,727, Cl. 52-173.00R.

Puccio, Guy S., to Acme Highway Products Corporation. Elastomeric expansion seal. 4,179,226, Cl. 404-64.000.

Pulido, Philippe: *See—*
Barrot, Jean C.; and Pulido, Philippe, 4,179,076, Cl. 241-216.000.

Quadri, Farooq M., to Burroughs Corporation. Magnetic bubble type D/A converter. 4,179,750, Cl. 365-8.000.

Quaker Oats Company, The: *See—*
Teter, Edward C., 4,179,066, Cl. 238-10.00E.

Queener, Carl A., to International Business Machines Corporation. Vector pinning in an electrophotographic machine. 4,179,213, Cl. 355-14.00R.

Quesinberry, Elmen C.; Tom, Michael; and Farrell, James L., to Westinghouse Electric Corp. Kalman estimator tracking system. 4,179,696, Cl. 343-7.400.

Quinlivan, Sandra C.: *See—*
Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., 4,179,551, Cl. 526-262.000.

R. A. Jones & Co. Inc.: *See—*
Hughes, Charles C., 4,178,839, Cl. 93-53.0SD.

R. E. Dietz Co.: *See—*
Nitsch, Edward J., 4,179,592, Cl. 200-61.270.

R. E. Phelon-Company, Inc.: *See—*
Burson, Bob O., 4,179,634, Cl. 310-153.000.

R. J. Reynolds Tobacco Company: *See—*
Long, Margaret E.; and Lee, Chin K., 4,179,335, Cl. 435-99.000.

Rabadan Peinado, Fernando: *See—*
Granados Jarque, Ricardo; Alvarez Domingo, Mercedes; Bosch Cartes, Juan; Martinez Roldan, Cristobal; and Rabadan Peinado, Fernando, 4,179,565, Cl. 546-63.000.

Rachais, Claude, to Creusot-Loire. Vacuum-spraying grinder. 4,179,075, Cl. 241-67.000.

Racouchot, Bernard: *See—*
Bentz, Gerard; and Racouchot, Bernard, 4,179,103, Cl. 266-225.000.

Radice, Robert. Portable hydrant wrench. 4,178,816, Cl. 81-57.300.

Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., to Janssen Pharmaceutica N.V. 5-[4-(Diarylmethyl)-1-piperazinylalkyl]benzimidazole derivatives. 4,179,505, Cl. 424-250.000.

Rahn, Arthur W.; Jones, Lewis O.; and Lu, Chin H., to Xerox Corporation. Electrostatographic developer with smooth surfaced carrier. 4,179,388, Cl. 430-108.000.

Raitto, Russell G., to Concord Laboratories, Inc. Method for drawing a blood sample. 4,178,941, Cl. 128-763.000.

Ramachandran, Kovilvila N.: *See—*
Sewell, Peter B.; and Ramachandran, Kovilvila N., 4,179,609, Cl. 250-397.000.

Ramanathan, Visvanathan, to Ciba-Geigy Corporation. Azo dyestuffs having a carboxyl group and a substituted sulfonylimino group in the coupling component. 4,179,435, Cl. 260-158.000.

Ramaswamy, Vellayan: *See—*
Kaminow, Ivan P.; and Ramaswamy, Vellayan, 4,179,189, Cl. 350-96.330.

Ramirez, Lawrence V., to G. Leblanc Corporation. Compact B-flat horn and case therefor. 4,178,830, Cl. 84-388.000.

Ray, Otis E. Marble game apparatus. 4,179,122, Cl. 273-85.00R.

Raychem Corporation: *See—*
Lofdahl, Clyde A., 4,179,319, Cl. 156-86.000.
Midgley, John A.; and Nyberg, David D., 4,179,320, Cl. 156-86.000.

Rayman, Vaclav: *See—*
Limberg, Jaroslav; Limberg, Tomas; and Rayman, Vaclav, 4,179,340, Cl. 202-262.000.

Raytheon Company: *See—*
Derby, Palmer P., 4,179,639, Cl. 315-39.690.

RCA Corporation: *See*—
Abbott, Liston, 4,179,703, Cl. 358-11.000.
Bachman, William J.; and Dimeo, Franklin R., 4,179,178, Cl. 339-111.000.
den Hollander, Willem, 4,179,642, Cl. 315-370.000.
Levin, Jonathan S., 4,178,974, Cl. 141-51.000.
Olsen, Gregory H.; and Ettenberg, Michael, 4,179,308, Cl. 136-89.0GA.
Sheng, Ping; and Firester, Arthur H., 4,179,708, Cl. 358-128.000.
Ream, Stanley L.: *See*—
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.
Rees, James G.: *See*—
Page, William R.; and Rees, James G., 4,179,165, Cl. 303-59.000.
Regan, Louis M.; Childers, Thomas W.; Anderson, Roy E.; and Burkhardt, Joseph A., to Exxon Production Research Company. Metal seal tubing plug. 4,178,992, Cl. 166-117.600.
Rehder, John E. Production of metals. 4,179,283, Cl. 75-40.000.
Reineke, Charles E.: *See*—
Nelson, Linnea E.; and Reineke, Charles E., 4,179,298, Cl. 106-18.210.
Reiner, Roland: *See*—
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.
Reinhard, Russell R.; and Yaffe, Roberta, to Texaco Inc. Synthetic aircraft turbine oil. 4,179,386, Cl. 252-46.600.
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Method of machine washing of solid soiled materials by reversibly contacting the circulating wash liquid with aluminosilicates. 4,179,268, Cl. 8-137.000.
Reiss, Guido: *See*—
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, 4,178,686, Cl. 433-201.000.
Reitz, Ronald P., to Tom Swift Enterprises, Inc. Electrical apparatus. 4,179,627, Cl. 307-261.000.
Research Triangle Institute: *See*—
Lamorte, Michael F., 4,179,702, Cl. 357-30.000.
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, to Metallgesellschaft Aktiengesellschaft. Direct-reduction process carried out in a rotary kiln. 4,179,280, Cl. 75-33.000.
Reuter, Herbert: *See*—
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Revesz, Clara: *See*—
Asselin, Andre A.; Humber, Leslie G.; Dionne, Gervais; Revesz, Clara; and Failli, Amedeo, 4,179,503, Cl. 424-248.510.
Reynolds, Elizabeth H.: *See*—
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,179,358, Cl. 208-114.000.
Reynolds Metals Company: *See*—
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.
Walsh, Adam J., 4,179,342, Cl. 204-35.00N.
Rhodes, John H., Jr., to International Business Machines Corporation. Paper alignment rollers. 4,179,117, Cl. 271-251.000.
Rhodes, William E., III: *See*—
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.
Rical, S.A.: *See*—
Fitte, Daniel, 4,179,044, Cl. 222-551.000.
Rich, Robert L. Multi-purpose hand truck. 4,179,132, Cl. 280-47.260.
Richardson, Daniel J.: *See*—
Bremer, Richard J.; and Richardson, Daniel J., 4,178,793, Cl. 73-23.000.
Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Method of starting gas production by injecting nitrogen-generating liquid. 4,178,993, Cl. 166-300.000.
Richardson, Michael: *See*—
Napolitano, Joseph J.; and Richardson, Michael, 4,178,960, Cl. 137-494.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
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Ricoh Co., Ltd.: *See*—
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Rieder, Matthias: *See*—
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.
Riefler, Roger G.; and Rolfe, Alfred, to Automatic Switch Company. Pilot operated sequencing valve. 4,178,963, Cl. 137-624.180.
Riehl, Fred, to Robertshaw Controls Company. Burner construction and parts therefor and methods of making the same. 4,179,261, Cl. 431-286.000.
Riess, Guido; Heide, Helmut; Reiner, Roland; Koster, Kari; and Brotz, Gunther, to Reiss, Guido. Artificial tooth with implantable tooth root. 4,178,686, Cl. 433-201.000.
Riessberger, Klaus: *See*—
Theurer, Josef; and Riessberger, Klaus, 4,179,216, Cl. 356-4.000.
Rigert Maschinenbau AG: *See*—
Heberle, Heinz, 4,179,012, Cl. 187-12.000.
Ripple, David E., to Lubrizol Corporation, The. Haloalkyl hydroxy-aromatic condensation products as fuel and lubricant additives. 4,179,449, Cl. 260-346.740.
Rippon, George M., to Biomechanics Limited. Apparatus for anaerobic digestion of biodegradable waste material. 4,179,220, Cl. 366-102.000.
Rise, Samuel F., III, to Bell Telephone Laboratories, Incorporated. Shorting contact for use with a male pin board. 4,179,173, Cl. 339-19.000.
Ritchie, Donald: *See*—
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.
Ritzenthaler, Richard A.: *See*—
Koch, James H.; and Ritzenthaler, Richard A., 4,179,313, Cl. 148-3.000.
Robb, Robert B. Apparatus for converting a skateboard into a scooter. 4,179,133, Cl. 280-87.04R.
Robert, Andre J.; Filippini, Jean C.; and Ferre, Michel, to Etat Francais as represented by the Delegue General pour l'armement. Dynamic photoelasticimeter with rotating birefringent element. 4,179,217, Cl. 356-33.000.
Robert Bosch GmbH: *See*—
Herth, Harro, 4,178,883, Cl. 123-32.0EE.
Knapp, Heinrich; and Hans, Waldemar, 4,179,069, Cl. 239-125.000.
Latsch, Reinhard; Bianchi, Valerio; and Burkel, Reiner, 4,178,891, Cl. 123-117.00R.
Mayer, Jurgen, 4,178,651, Cl. 15-250.320.
Podrapsky, Jiri; and Orova, Josef, 4,178,892, Cl. 123-117.00R.
Voegele, Guenther, 4,178,929, Cl. 128-213.00R.
Wessel, Wolf, 4,178,798, Cl. 73-113.000.
Roberto, Frederick J.: *See*—
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., 4,179,297, Cl. 106-1.120.
Robertshaw Controls Company: *See*—
Frankenberg, Alfred A., 4,178,837, Cl. 91-387.000.
Riehl, Fred, 4,179,261, Cl. 431-286.000.
Robinson, Gregory A. Method and apparatus for photographing chemiluminescent objects. 4,179,204, Cl. 354-145.000.
Rockford Machine Tool Co.: *See*—
Swanson, Eugene S.; and Winters, Joel M., 4,178,673, Cl. 29-453.000.
Rockwell Internation Corporation: *See*—
Evans, Gregory W.; and Paul, James E., 4,179,693, Cl. 343-5.0MM.
Rockwell International Corporation: *See*—
Catterfeld, Fritz C., 4,179,239, Cl. 415-198.100.
Lange, Frederick F., 4,179,486, Cl. 264-65.000.
Rockwell, Randal L., to Allis-Chalmers Corporation. Folding mechanism for a multiple section agricultural implement. 4,178,998, Cl. 172-311.000.
Rockwell-Rimoldi, S.p.A.: *See*—
Marcandalli, Ulderico, 4,178,864, Cl. 112-159.000.
Rohm GmbH: *See*—
Braeumer, Klaus; Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,179,333, Cl. 435-60.000.
Vetter, Heinz, 4,179,529, Cl. 427-44.000.
Rohowetz, Stanley E.; and Schoenfisch, Eric, to American Can Company. Indicator ink. 4,179,397, Cl. 252-408.000.
Rohrberg, Roderick G.: *See*—
Savor, Dennis E.; and Rohrberg, Roderick G., 4,178,966, Cl. 138-89.000.
Rohrkemper, Robert R.: *See*—
Coviello, Allan J.; Bernardin, Frederick E., Jr.; and Rohrkemper, Robert R., 4,179,616, Cl. 250-527.000.
Rolfe, Alfred: *See*—
Riefler, Roger G.; and Rolfe, Alfred, 4,178,963, Cl. 137-624.180.
Rolph, Donald L., to Memorex Corporation. Flexible magnetic recording disc drive with interlock to protect recording disc cartridge. 4,179,718, Cl. 360-99.000.
Romney, Russell H. Information display system. 4,179,688, Cl. 340-373.000.
Rosaen, Nils O. Fluid filtering device. 4,179,372, Cl. 210-90.000.
Rosan Engineering Corp.: *See*—
Rosan, Jose, Jr., 4,179,038, Cl. 220-243.000.
Rosan, Jose, Jr., to Rosan Engineering Corp. Self-sealing flange and method of installation thereof. 4,179,038, Cl. 220-243.000.
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, to Bayer Aktiengesellschaft. Process for the production of binders. 4,179,478, Cl. 525-113.000.
Roshan, Natalia R.: *See*—
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.
Ross, Joseph A.; and Stern, Howard K., to Solid Photography Inc. Numerically controlled milling with parabolic profile tools for surface smoothness. 4,179,228, Cl. 407-57.000.
Rossani, Aldo, to C.I.E.R. Compagnia Importazioni Esportazioni Rappresentanze S.R.L. Magnetic compasses. 4,179,741, Cl. 364-457.000.
Rossler, Hermann: *See*—
Krumeich, Jorg; and Rossler, Hermann, 4,179,195, Cl. 351-4.000.

Rossomando, Robert, to Polychrome Corporation. Finger nail lacquer. 4,179,304, Cl. 106-177.000.
Roth, Martin, to Ciba-Geigy Corporation. Process for the manufacture of iso-imides or mixtures of iso-imides and imides. 4,179,444, Cl. 260-326.00N.
Rothbuhr, Lothar; and Voll, Manfred, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of carbon black. 4,179,494, Cl. 423-456.000.
Rothenberger GmbH & Co.: *See—*
Rothenberger, Karl, 4,178,786, Cl. 72-117.000.
Rothenberger, Karl, to Rothenberger GmbH & Co. Necking-out tool for forming necks on pipes. 4,178,786, Cl. 72-117.000.
Rothgery, Eugene F.; and Schroeder, Hansjuergen A., to Olin Corporation. 1-Halo- and 1-lower alkoxy-4-trichloromethylphthalazines. 4,179,559, Cl. 544-237.000.
Roussel UCLAF: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,179,575, Cl. 562-506.000.
Rowe, Jerry R. Air conditioning system. 4,178,764, Cl. 62-81.000.
Rowinski, Anthony S. Dry wall repair kit. 4,178,730, Cl. 52-514.000.
Rubio, Charles A., to CVG-Siderurgica del Orinoco, C.A. Method for the reduction of metal oxides. 4,179,282, Cl. 75-35.000.
Rubisch, Ottmar: *See—*
Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, 4,179,289, Cl. 75-206.000.
Rudkin, Arthur L.; Clint, John H.; and Young, Kenneth, to Procter & Gamble Company, The. Textile conditioning compositions containing polymeric cationic materials. 4,179,382, Cl. 252-8.800.
Rudolph Beaver, Inc.: *See—*
Kozlowski, George J., Jr., 4,178,797, Cl. 73-104.000.
Ruenzi, Kurt. Sheet feeding and collating apparatus. 4,179,115, Cl. 271-297.000.
Ruff, James W., to United States Steel Corporation. Simultaneous plug-mill rolling for increased production and enhanced tube quality. 4,178,789, Cl. 72-209.000.
Rupilius, Wolfgang: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Russell, David B., to Dennison Manufacturing Company. Feed and severing apparatus. 4,179,063, Cl. 227-67.000.
Russell, Ronald R., to General Electric Company. Control circuit for circuit breaker DC motor operator. 4,179,646, Cl. 318-380.000.
Rutzen, Horst: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.
Rybinsky, Alexandr G.: *See—*
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V., 4,179,487, Cl. 261-114.00R.
Ryder, Francis E.; and Thomas, Michael D., to Ryder International Corporation. Vacuum curettage device with vacuum indicator. 4,178,932, Cl. 128-276.000.
Ryder International Corporation: *See—*
Ryder, Francis E.; and Thomas, Michael D., 4,178,932, Cl. 128-276.000.
Thomas, Michael D., 4,179,051, Cl. 222-494.000.
Rykowski, John J. Silane coupling agents. 4,179,537, Cl. 427-387.000.
Ryobi Ltd.: *See—*
Ishii, Koji, 4,178,848, Cl. 101-142.000.
S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl G., 4,178,814, Cl. 74-781.00R.
Saab-Scania Aktiebolag: *See—*
Sjodin, Bo, 4,179,707, Cl. 358-107.000.
Sablich, Milan; and Bedard, Eugene J., to Consolidated Foods Corporation. Shutoff and bypass valve. 4,179,373, Cl. 210-98.000.
Sabo, Robert C. Mine life line system. 4,179,160, Cl. 299-12.000.
Sadan, Abraham. Dehydration process. 4,179,493, Cl. 423-279.000.
Sadauskas, Joseph J., to H. K. Porter, Inc. Ratchet cable cutter. 4,178,682, Cl. 30-250.000.
Sadkova, Natalia A.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.
Sadler, Philip M. Cylindrical planetarium projector. 4,178,701, Cl. 35-42.500.
Sagara, Hiroji, to Hoya Corporation. Optical glass. 4,179,300, Cl. 106-47.00Q.
Sagara, Seiji: *See—*
Umezawa, Kazumi; Hattori, Hiroyuki; Ogawa, Hiroshi; Kishi, Hirotoshi; and Sagara, Seiji, 4,179,116, Cl. 271-306.000.
Sahasrabudhe, Arun P.; and Kapadia, Jayant K., to Westinghouse Electric Corp. Failsafe logic function apparatus. 4,179,629, Cl. 307-311.000.
Saint-Gobain Industries: *See—*
Chiron, Georges, 4,179,595, Cl. 219-10.55F.
Ortmanns, Gunther; Kraemling, Franz; and Pikhard, Siegfried, 4,178,728, Cl. 52-232.000.
Saito, Kazuo: *See—*
Tuzuki, Minoru; Matuba, Kuniyoshi; and Saito, Kazuo, 4,179,481, Cl. 525-80.000.
Saito, Yoshio: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.
Saka, Hamid J.: *See—*
Laitkep, Anthony A.; Meyer, Danny S.; and Saka, Hamid J., 4,179,098, Cl. 251-167.000.
Sakaguchi, Hirofumi: *See—*
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,179,601, Cl. 219-216.000.
Sakai, Kazuo; Akiba, Shigeyuki; and Yamamoto, Takaya, to Kokusai Denshin Denwa Kabushiki Kaisha. Method for producing compound semiconductor crystals. 4,179,317, Cl. 148-171.000.
Sakai, Takeo: *See—*
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, to Sumitomo Naugatuck Co., Ltd. Method for preparation of a plated product. 4,179,341, Cl. 204-20.000.
Sakanoue, Seiki: *See—*
Hirano, Shigeo; Adachi, Keiichi; Sakanoue, Seiki; and Kamio, Takayoshi, 4,179,293, Cl. 430-551.000.
Sakauye, Wallace S. Device for sealing the gap under a door. 4,178,717, Cl. 49-70.000.
Sakurai, Hisayuki: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,179,557, Cl. 544-28.000.
Sakurai, Tadashi: *See—*
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, 4,179,628, Cl. 307-279.000.
Salas, Frank D. Housing module and space frame. 4,178,736, Cl. 52-648.000.
Samsioe, Per-Edward. Method and apparatus for rapid battery charging. 4,179,648, Cl. 320-11.000.
Sanada, Noriaki: *See—*
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., to W. R. Grace & Co. Process for preparing spheroidal alumina particles. 4,179,408, Cl. 252-448.000.
Sanders Associates, Inc.: *See—*
Townsend, Robert L., 4,179,682, Cl. 367-135.000.
Sandoz, Inc.: *See—*
Nadelson, Jeffrey, 4,179,566, Cl. 546-116.000.
Sandoz Ltd.: *See—*
Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, 4,179,578, Cl. 560-76.000.
Santa Fe International Corporation: *See—*
Chang, Nuke M.; Emmerson, John O.; Ritchie, Donald; and Hollenbeck, William, 4,179,059, Cl. 228-103.000.
Santora, James V. Incandescent light bulb with multiple filaments providing multiple lives. 4,179,637, Cl. 313-316.000.
Sanyo Electric Co., Ltd.: *See—*
Ohgishi, Tsutomu; Akiyama, Toru; and Sakurai, Tadashi, 4,179,628, Cl. 307-279.000.
Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Process for producing magnetic FE oxide. 4,179,387, Cl. 252-62.560.
Sashin, Donald; and Sternglass, Ernest J., to University of Pittsburgh. Radiography apparatus. 4,179,100, Cl. 250-416.0TV.
Sasse, Klaus: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.
Sassenhausen, Herbert R., to Eastman Kodak Company. Process of eliminating cracking in the coating of TiO_2 layers. 4,179,538, Cl. 430-213.000.
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,179,296, Cl. 430-574.000.
Sato, Koichi: *See—*
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, 4,179,242, Cl. 417-8.000.
Sato, Kyosaku: *See—*
Edwards, Douglas C.; and Sato, Kyosaku, 4,179,421, Cl. 260-23.70M.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Inking device for label printing and applying machine. 4,178,849, Cl. 101-305.000.
Satoh, Ken; and Yanagida, Tuneo, to Olympus Optical Company, Ltd. Tape end warning apparatus. 4,179,716, Cl. 360-74.300.
Sauciuc, Alexandru; Nitelea, Ion; Paunescu, Eugeniu; Diaconescu, Constantin; Albu, Margareta; Bulgaru, Liliana; and Diaconu, Eugen, to Intreprinderea de Antibiotice Iasi. Rifamycins and method for their preparation. 4,179,439, Cl. 260-239.30P.
Sauvage, Philippe, to Compagnie Generale des Etablissements Michelin. Installation for manufacturing a metal wire by continuous casting. 4,178,985, Cl. 164-250.000.
Savage, Elton S.; and Chen, Jeffrey J., to Dravo Corporation. Apparatus for the treatment of wastewater. 4,179,374, Cl. 210-151.000.
Savar, Cindy: *See—*
Savar, Eugene J.; and Savar, Cindy, 4,179,139, Cl. 282-23.00R.
Savar, Eugene J.; and Savar, Cindy. Combination check and credit card sales slip. 4,179,139, Cl. 282-23.00R.

Savitsky, Evgeny M.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Savor, Dennis E.; and Rohrberg, Roderick G., to Combustion Engineering, Inc. Tube plug. 4,178,966, Cl. 138-89.000.

Sawafuji, Tosuke: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.

Saxman, William C.: *See—*
Mitchell, Howard E.; and Saxman, William C., 4,179,000, Cl. 175-53.000.

Schaub, Robert E.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., 4,179,451, Cl. 260-395.000.

Scheinpflug, Hans: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Schenectady Chemicals, Inc.: *See—*
Laganis, Deno, 4,179,420, Cl. 260-21.000.
Laganis, Deno; and Begley, Paul M., 4,179,423, Cl. 260-29.20N.

Schenk-Filterbau Gesellschaft mit beschrankter Haftung: *See—*
Baur, Rolf, 4,179,381, Cl. 210-456.000.

Schenker, Emil, to Sorna Watch S.A. Pendant comprising a sleeve in combination with a timepiece. 4,178,753, Cl. 58-152.00R.

Schering Aktiengellschaft: *See—*
Weber, Alfred; Kennecke, Mario; and Dahl, Helmut, 4,179,336, Cl. 435-55.000.

Scheuerman, Ronald F.: *See—*
Richardson, Edwin A.; and Scheuerman, Ronald F., 4,178,993, Cl. 166-300.000.

Schiffer, Gunter, to Kleinewefers Gesellschaft mit beschrankter Haftung. Device for printing by sublimation. 4,178,782, Cl. 68-5.00D.

Schillreff, George H., to General Dynamics Corporation, Pomona Division. Multiple sequential burst system. 4,178,854, Cl. 102-89.0CD.

Schleier, Richard L.: *See—*
Barra, Frank J.; and Schleier, Richard L., 4,179,328, Cl. 159-16.00R.

Schmelzer Corporation: *See—*
Benjamin, Benjamin C., 4,178,895, Cl. 123-119.00F.

Schmerling, Donald W., to Chemetron Corporation. Wire-feeding mechanism. 4,179,056, Cl. 226-171.000.

Schmid, Frederick, to Crystal Systems, Inc. Process of forming a wire pack. 4,178,670, Cl. 29-417.000.

Schmid, Hans F., to Mar-Kal Products Corporation. Flip leaf exhibitor having separable ring fasteners for leaves. 4,178,710, Cl. 40-530.000.

Schmid, Otto: *See—*
Barthell, Eduard; and Schmid, Otto, 4,179,367, Cl. 210-41.000.

Schmidt, Curt: *See—*
Dustmann, Cord-Henrich; Schmidt, Curt; and Pasztor, Gabriel, 4,178,676, Cl. 29-599.000.

Schmidt, Robert R.: *See—*
Beck, Gunther; Sasse, Klaus; Heitzer, Helmut; Eue, Ludwig; Schmidt, Robert R.; Scheinpflug, Hans; Hammann, Ingeborg; and Brandes, Wilhelm, 4,179,277, Cl. 71-92.000.

Schmidt, Waldemar M.: *See—*
Staats, Henry N.; Schmidt, Waldemar M.; and Davila, Efrain A., 4,179,325, Cl. 156-498.000.

Schmieder, Lothar; Vilgertshofer, August; and Mettin, Florian, to Deutsch Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Force and bending moment sensing arrangement and structure. 4,178,799, Cl. 73-141.00A.

Schmitz, Charles R.: *See—*
Isaac, L. Henry; Nowak, Edward J.; and Schmitz, Charles R., 4,179,168, Cl. 312-125.000.

Schmut, Wolfgang: *See—*
Zuckert, Bertram; Schmut, Wolfgang; and Behmel, Klaus, 4,179,428, Cl. 260-29.40R.

Schnabel, Wolfram: *See—*
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, 4,179,280, Cl. 75-33.000.

Schnegelberger, Harald: *See—*
Andree, Hans; Jung, Dieter; Bischoff, Martin; Conrad, Jens; Huppertz, Josef; Jakobi, Gunter; Krings, Peter; Kuhling, Dieter; Reuter, Herbert; Rupilius, Wolfgang; Rutzen, Horst; and Schnegelberger, Harald, 4,179,393, Cl. 252-155.000.

Schnellbacher, Kurt; Muller, Klaus; and Gorlitz, Frank-Otto, to Buhler-Miag GmbH. Dual-table separating apparatus. 4,179,363, Cl. 209-481.000.

Schnurrbusch, Karl: *See—*
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.

Schockmel, Robert: *See—*
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,179,275, Cl. 65-20.000.

Schoenfisch, Eric: *See—*
Rohowetz, Stanley E.; and Schoenfisch, Eric, 4,179,397, Cl. 252-408.000.

Schon, Franz: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,178,705, Cl. 38-144.000.

Schopp, Edgar. Flexible pipe fitting. 4,179,142, Cl. 285-239.000.

Schotten, Alfons; and Spolgen, Hermann J., to Eberhard Hoesch & Sohne GmbH & Co. Shifting device for a plate filter press. 4,179,377, Cl. 210-230.000.

Schreiber, William L.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.

Schreiner, Juan M., to Jumberca, S.A. Stitch cams for circular knitting machines. 4,178,779, Cl. 66-54.000.

Schroeder, Hansjuergen A.: *See—*
Rothgery, Eugene F.; and Schroeder, Hansjuergen A., 4,179,559, Cl. 544-237.000.

Schroeter, Siegfried H.; and Olson, Daniel R., to General Electric Company. UV curable resin compositions containing urethanes of hydroxybenzotriazoles or urethanes of hydroxy benzophenones. 4,179,548, Cl. 525-329.000.

Schuck, William H. Sealed dispenser spout assembly. 4,179,042, Cl. 222-89.000.

Schuermann, Josef H., to Texas Instruments Deutschland GmbH. HF-amplifier circuit. 4,179,668, Cl. 330-277.000.

Schulte-Elte, Karl-Heinrich; Fankhauser, Peter; and Ohloff, Gunther, to Firmenich, S.A. Spirane derivatives useful as perfuming and flavor-modifying ingredients. 4,179,448, Cl. 260-346.110.

Schultz, Helmut, to Hoesch Werke Aktiengesellschaft. Measuring device for checking the dimensional accuracy of the track width of curved transport tracks, particularly for continuous casting or extrusion. 4,178,692, Cl. 33-182.000.

Schultz, Robert J.; and Starks, Fred W. Preparation of N-(phosphonoacetyl)-L-aspartic acid. 4,179,464, Cl. 260-502.500.

Schundehutte, Karl H.: *See—*
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.

Schutt and Grundei O.H.G.: *See—*
Grundei, Hans; and Thomas, Wolfram, 4,178,641, Cl. 3-1.911.

Schutze, Detlef-Ingo; Bien, Hans-Samuel, deceased (by Bien, Else, Gabriele Bien, Dorothee Bien, legal representatives); Bien, Petra, heir; and Bien, Daniel, heir, to Bayer Aktiengesellschaft. Process for the preparation of 1-acylamino-5(8)-chloroanthraquinones. 4,179,450, Cl. 260-377.000.

Schwarte, Jurgen: *See—*
Lichtenberger, Horst; Knoblauch, Karl; Grochowski, Horst; Juntgen, Harald; and Schwarte, Jurgen, 4,179,399, Cl. 252-411.00S.

Schwartz, Joseph: *See—*
Krapcho, John; and Schwartz, Joseph, 4,179,558, Cl. 544-174.000.

Schwartzman, Everett H. Heat source and heat sink pumping system and method. 4,178,761, Cl. 60-648.000.

Schweizer, Herbert. Ski slope. 4,179,539, Cl. 428-58.000.

Schwender, Charles F.; and Sunday, Brooks R., to Warner-Lambert Company. (Substituted 2-carboxyanilino)nicotinic acids as inhibitors of allergic reactions. 4,179,509, Cl. 424-266.000.

Schwuger, Milan J.: *See—*
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Sciaky Bros., Inc.: *See—*
Connors, John F.; Bass, Douglas D.; Bell, Michael G.; and Ream, Stanley L., 4,179,316, Cl. 148-152.000.

SCM Corporation: *See—*
Kane, Bernard J.; and Von Genk, Richard A., 4,179,468, Cl. 260-567.60M.
Mehta, Anil B.; and Zielinski, Richard J., 4,179,454, Cl. 260-409.000.

Scott & Fetzer Company, The: *See—*
Volker, James W., 4,179,246, Cl. 417-313.000.

Scott, John W.: *See—*
Berger, Leo; and Scott, John W., 4,179,443, Cl. 260-315.000.

Security Patrols Co., Ltd.: *See—*
Nakauchi, Shunsaku; and Takahashi, Akifusa, 4,179,606, Cl. 250-339.000.

Seidel, John G.: *See—*
Felice, Patrick E.; Gonzalez, Joseph L.; and Seidel, John G., 4,179,614, Cl. 250-253.000.

Seim, William J.: *See—*
Farrell, Francis M., III; Otto, Robert B.; and Seim, William J., 4,179,050, Cl. 222-386.000.

Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, to Bochumer Eisenhutte Heintzmann GmbH & Co. Door-like closure. 4,178,859, Cl. 109-27.000.

Selas, George J., to Allen-Bradley Company. Time delay relay movement. 4,179,676, Cl. 335-59.000.

Seldner, Alvin A., to Allied Chemical Corporation. Process for coating pyrotechnic materials. 4,179,327, Cl. 156-667.000.

Senco Products, Inc.: *See—*
Becht, Carl T.; and Hueil, J. Charles, 4,179,057, Cl. 227-19.000.

Seneca Sawmill Company, Inc.: *See—*
Jones, Aaron U., 4,179,236, Cl. 414-117.000.

Senina, Elena D.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Serbent, Harry: *See—*
Reuter, Gerhard; Schnabel, Wolfram; and Serbent, Harry, 4,179,280, Cl. 75-33.000.
Serebryakov, Evgeny A.: *See—*
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.
Sergev, Sergius S., to United States of America, Navy. Electromechanical low backlash cable connector. 4,179,583, Cl. 174-21.00R.
Seufert, Gerhard. Apparatus for forming flexible fold lines in thermoplastic sheets and article so formed. 4,179,252, Cl. 425-174.600.
Sevastakis, Gus. Method and apparatus for continuously casting hollow bars. 4,178,982, Cl. 164-85.000.
Sewell, Peter B.; and Ramachandran, Kovilvila N. Point scattering detector. 4,179,609, Cl. 250-397.000.
Shafer, David R., to Perkin-Elmer Corporation, The. Laser fusion optical system. 4,179,192, Cl. 350-294.000.
Shalita, Benyamin: *See—*
Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, 4,179,517, Cl. 424-283.000.
Shannon, Richard F., to Owens-Corning Fiberglas Corporation. Method of producing structural insulation materials containing at least 50 percent xonotlite. 4,179,303, Cl. 106-119.000.
Shannon, Shelly L. Electrical connector. 4,179,171, Cl. 339-17.0LC.
Shapiro, Howard M. Method and system for non-invasive detection of zinc protoporphyrin in erythrocytes. 4,178,917, Cl. 128-665.000.
Sharp, Denis; and Skoyles, Derek R., to U.S. Philips Corporation. Anti-lock vehicle brake system with variable decay rate. 4,179,166, Cl. 303-119.000.
Sharp Kabushiki Kaisha: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,179,584, Cl. 179-1.0SM.
Tateishi, Iwao, 4,178,691, Cl. 33-139.000.
Shaw, David N., to Dunham-Bush, Inc. Reverse fan heat pump defrost control system. 4,178,767, Cl. 62-155.000.
Shaw, David N., to Dunham-Bush, Inc. Oil equalization system for parallel connected hermetic helical screw compressor units. 4,179,248, Cl. 417-427.000.
Shea, Evan P.: *See—*
Krause, William A.; and Shea, Evan P., 4,179,347, Cl. 204-149.000.
Shelef, Mordecai: *See—*
Gandhi, Haren S.; Shelef, Mordecai; and Wynblatt, Paul P., 4,179,413, Cl. 252-472.000.
Shell Oil Company: *See—*
Felton, John C.; Badmin, John S.; and Twydell, Roland S., 4,179,518, Cl. 424-300.000.
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,402, Cl. 252-431.00C.
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,403, Cl. 252-431.00C.
Richardson, Edwin A.; and Scheuerman, Ronald F., 4,178,993, Cl. 166-300.000.
Sheng, Ping; and Firester, Arthur H., to RCA Corporation. Optical playback system having increased depth-of-field. 4,179,708, Cl. 358-128.000.
Sheng, Tan T.: *See—*
Chang, Chuan C.; Ermanis, Felix; McCoy, Robert J.; Nakahara, Shohei; and Sheng, Tan T., 4,179,534, Cl. 427-89.000.
Shenoy, Raghuram D.; and Ganapathy, Anantharam, to Cadbury India Limited. Process for the production of modified vegetable fats. 4,179,455, Cl. 260-409.000.
Shenoy, Raghuram D.; and Ganapathy, Anantharam, to Cadbury India Limited. Process for the production of modified vegetable fats. 4,179,456, Cl. 260-409.000.
Shepherd, Michael, to Wallace Murray Corporation. Meta reinforced plastic damper hub. 4,178,811, Cl. 74-574.000.
Sherman, Ralph R., Jr.: *See—*
Harris, Raymond W.; and Sherman, Ralph R., Jr., 4,179,661, Cl. 325-455.000.
Shibata, Shinya: *See—*
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, 4,179,584, Cl. 179-1.0SM.
Shibatani, Juichi: *See—*
Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, 4,178,756, Cl. 60-397.000.
Shilton, Mark G.: *See—*
Howe, Arthur T.; and Shilton, Mark G., 4,179,491, Cl. 423-253.000.
Shimada, Masaru: *See—*
Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, 4,179,706, Cl. 358-44.000.
Shimano Industrial Company Limited: *See—*
Kine, Masayoshi, 4,179,013, Cl. 188-26.000.
Noda, Hideo, 4,179,084, Cl. 242-212.000.
Shimizu, Mahito: *See—*
Sasazawa, Koji; Shimizu, Mahito; and Kitamoto, Tatsuji, 4,179,387, Cl. 252-62.560.
Shimizu, Tadao: *See—*
Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, 4,179,496, Cl. 423-598.000.
Shimonishi, Yasutsugu: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,179,557, Cl. 544-28.000.
Shin-Etsu Chemical Co. Ltd.: *See—*
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, 4,179,295, Cl. 428-447.000.
Shin Meiwa Industry Co., Ltd.: *See—*
Maruyama, Shigeo; Nishikaiji, Yuji; Miura, Tatsuya; and Fujinaga, Shigeki, 4,179,602, Cl. 219-125.100.
Shin-Shirasuna Electric Corporation: *See—*
Nakazono, Akio; and Nakamura, Shizuo, 4,179,721, Cl. 360-137.000.
Shindo, Minoru: *See—*
Ochi, Kiyoshige; Matsunaga, Isao; Shindo, Minoru; and Kaneko, Chikara, 4,179,452, Cl. 260-397.200.
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, to Tokyo Electric Power Co. Inc., The; and Osaki Electric Co., Ltd. Carrier control method by using phase-pulse signals. 4,179,624, Cl. 307-3.000.
Shinohara, Toshio: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.
Shinsako, Joe H. Sanitary dog litter bagger. 4,179,145, Cl. 294-19.00R.
Shirasaka, Tadashi: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.
Shishkin, Petr T.: *See—*
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.
Shoemaker, Edwin J.; Pacitti, William; and Baumann, Marvin J., to La-Z-Boy Chair Company. Wall reclining rocking chair. 4,179,157, Cl. 297-83.000.
Shoji, Toshihiro: *See—*
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.
Shumate, William G.: *See—*
Hawton, John T., Jr.; and Shumate, William G., 4,179,351, Cl. 204-298.000.
Shy, Min C. Fixed latch lock. 4,179,143, Cl. 292-179.000.
Shyu, Ji Y., to Yang, Yin-Lung, a part interest. Rescue signal device. 4,178,867, Cl. 114-39.000.
Siargas — Societa' Italiana Assistenza Reti Gas S.p.A.: *See—*
Moschetti, Armando, 4,178,875, Cl. 118-712.000.
Sideris, John N. J.: *See—*
Bromell, Raymond J.; and Sideris, John N. J., 4,179,233, Cl. 414-139.000.
Sidi, Henri: *See—*
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.
Sidorenko, Valery A.: *See—*
Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., 4,178,818, Cl. 82-36.00R.
Sieb, Paul A.; Deyoe, Charles W.; and Hoseney, Russell C., to Kansas State University Research Foundation. Method of preparation of 2-phosphate esters of ascorbic acid. 4,179,445, Cl. 260-340.90R.
Siegel, Rudolf: *See—*
Dillenburg, Helmut; Dotsch, Werner; and Siegel, Rudolf, 4,179,394, Cl. 252-186.000.
Siegenia-Frank AG.: *See—*
Frank, Gerhard; and Kucharczyk, Eckhard, 4,178,841, Cl. 98-98.000.
Sieklucki, James F.; and Veld, Ralph, Jr., to Sieklucki, James F. Urinary drainage bag support. 4,179,159, Cl. 297-192.000.
Siemens Aktiengesellschaft: *See—*
Geckeler, Siegfried, 4,179,188, Cl. 350-96.310.
Neuendorff, Hans, 4,179,643, Cl. 315-411.000.
Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, 4,178,677, Cl. 29-605.000.
Siewert, Robert L., to Clark Equipment Company. Multiple parking brake. 4,179,015, Cl. 188-106.00P.
Sigmon, Ned A., to Liggett Group Inc. Method for making a hollow filter rod. 4,179,323, Cl. 156-201.000.
Sigri Elektrographit GmbH: *See—*
Brandmair, Franz; Rubisch, Ottmar; and Honig, Dietmar, 4,179,289, Cl. 75-206.000.
Silverman, Gordon: *See—*
Launzel, Edward A.; and Silverman, Gordon, 4,179,733, Cl. 364-200.000.
Simon Engineering Dudley Limited: *See—*
Ashworth, Denis H., 4,179,010, Cl. 182-2.000.
Simonds, Michael E., to Stork Gamco, Inc. Transfer apparatus for poultry processing conveyor. 4,178,659, Cl. 17-24.000.
Simpson, Howard D., to Union Oil Company of California. Cobalt-molybdenum-alumina desulfurization catalyst. 4,179,410, Cl. 252-465.000.
Singer, Arnold J.: *See—*
Lynch, Donald M.; Lover, Myron J.; Singer, Arnold J.; and Rhodes, William E., III, 4,179,504, Cl. 424-248.400.
Singer Company, The: *See—*
Adams, Kenneth D., 4,178,866, Cl. 112-278.000.
Harvell, Don L., 4,179,632, Cl. 310-50.000.
Lawrie, Donald, 4,178,863, Cl. 112-158.00D.
Odermann, Charles R.; and Johnson, Ralph E., 4,178,865, Cl. 112-261.000.
Sirovich, Bruce E.: *See—*
Bowman, Walker H.; and Sirovich, Bruce E., 4,178,987, Cl. 165-1.000.
Sjodin, Bo, to Saab-Scania Aktiebolag. Automatic measurement of lengths of elongated workpieces. 4,179,707, Cl. 358-107.000.

Skaugset, Richard L.: *See—*
Erdmann, Joachim C.; Gellert, Robert I.; and Skaugset, Richard L., 4,179,218, Cl. 356-336.000.

Skil Corporation: *See—*
Vassos, Louis J., 4,179,644, Cl. 318-17.000.

Skinner, Robert I.; and Heine, Arnold J., to Development Finance Corporation of New Zealand. Mechanical attenuator. 4,179,104, Cl. 267-154.000.

Skirmai nee Sarkozi, Maria: *See—*
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.

Skoyles, Derek R.: *See—*
Sharp, Denis; and Skoyles, Derek R., 4,179,166, Cl. 303-119.000.

Skrynnikov, Vladimir I.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Slater, John. Motorcycle front wheel suspension system. 4,179,135, Cl. 280-276.000.

Slayton, Curtis R., to General Electric Company. Means for causing the accumulation of refrigerant in a closed system. 4,178,765, Cl. 62-83.000.

Smarook, Walter H., to Union Carbide Corporation. Fabrication of foamed articles. 4,179,540, Cl. 428-71.000.

Smashey, Russell W., to General Electric Company. Furnace for directional solidification casting. 4,178,986, Cl. 164-251.000.

Smemo, Alfred S., to Deere & Company. Split input planetary transmission. 4,178,813, Cl. 74-764.000.

Smetana, Daryl L., to Ford Aerospace and Communications Corporation. Cryostat assembly. 4,178,775, Cl. 62-514.0JT.

Smirnov, Viktor S.: *See—*
Mischenko, Alexandr P.; Gryaznov, Vladimir M.; Smirnov, Viktor S.; Senina, Elena D.; Parbuzina, Iraida L.; Roshan, Natalia R.; Polyakova, Viktoria P.; and Savitsky, Evgeny M., 4,179,470, Cl. 260-580.000.

Smith, Alvin J. Aeration of waste in septic tank. 4,179,375, Cl. 210-197.000.

Smith, Don H.; and Barton, Leslie W., to Atlas Powder Company. Delay actuated explosive device. 4,178,852, Cl. 102-24.00R.

Smith, Frank: *See—*
Davies, Michael; Hourihan, Glyn; and Smith, Frank, 4,179,653, Cl. 324-65.0CR.

Smith, Frederick R., to Avtex Fibers Inc. Alloy rayon fibers having dispersed therein an amide polymer and a polyacrylic acid salt. 4,179,416, Cl. 260-17.4CL.

Smith, Gene D. Split image bow sight and range finder. 4,178,693, Cl. 33-265.000.

Smith Industries, Inc.: *See—*
Barra, Frank J.; and Schleier, Richard L., 4,179,328, Cl. 159-16.00R.

Smith, Morris R. Holographic jewel. 4,179,182, Cl. 350-3.690.

Smith, Peter D. Radiation tracking control. 4,179,612, Cl. 250-203.00R.

Smith, Stanley T. Revolving mirror scanning interferometer. 4,179,219, Cl. 356-346.000.

Smolka, Heinz: *See—*
Reinwald, Elmar; Smolka, Heinz; Schwuger, Milan J.; and Koppelmann, Edgar, 4,179,268, Cl. 8-137.000.

Snow, Milton L. Apparatus for controlling related equipment and for enabling hand free usage. 4,179,590, Cl. 179-156.00A.

Sobierajski, Isabelle M.: *See—*
Buescher, William E.; Roberto, Frederick J.; and Sobierajski, Isabelle M., 4,179,297, Cl. 106-1.120.

Societe Anonyme des Etablissements Staubli: *See—*
Palau, Joseph, 4,178,958, Cl. 137-460.000.

Societe Anonyme Francaise du Ferodo: *See—*
Bacher, Michel, 4,178,808, Cl. 74-230.17E.

Societe de Paris et du Rhone: *See—*
Mazzorana, Alfred, 4,178,805, Cl. 74-6.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Bernat, Jean-Pierre, 4,179,348, Cl. 204-151.000.

Sodip S.A.: *See—*
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,179,380, Cl. 210-321.00A.

Soeding, Horst, to Polygram GmbH. Process for producing a disc-shaped information carrier which has information in the form of a beam-reflecting structure. 4,179,532, Cl. 427-54.100.

Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, to Olympus Optical Company, Ltd. Liquid feeder for automatic culture apparatus. 4,179,339, Cl. 435-292.000.

Solar Kinetics, Inc.: *See—*
Hutchison, J. A., 4,178,913, Cl. 126-424.000.

Solarspan, Inc.: *See—*
Mattson, John P., 4,178,911, Cl. 126-449.000.

Solartron Electronic Group Limited, The: *See—*
Potter, Peter N., 4,178,804, Cl. 73-702.000.

Solid Photography Inc.: *See—*
Ross, Joseph A.; and Stern, Howard K., 4,179,228, Cl. 407-57.000.

Solomakha, Gennady P.: *See—*
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V., 4,179,487, Cl. 261-114.00R.

Soltan, Parviz: *See—*
Fletcher, Paul C.; and Soltan, Parviz, 4,178,708, Cl. 40-451.000.

Sony Corporation: *See—*
Hanzawa, Hisashi; and Yoshino, Kozi, 4,178,809, Cl. 74-483.0PB.
Nagumo, Fumio, 4,179,711, Cl. 358-213.000.
Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, 4,179,706, Cl. 358-44.000.

Sorna Watch S.A.: *See—*
Schenker, Emil, 4,178,753, Cl. 58-152.00R.

Soshnikova, Inna V., administrator: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Sostek, Ronald J.: *See—*
Swartz, Peter J.; and Sostek, Ronald J., 4,178,646, Cl. 7-156.000.

Southern, William: *See—*
Garrison, C. Gene; and Southern, William, 4,178,853, Cl. 102-27.00R.

Spadini, Gianfranco L.; and Tolliday, Ian D., to Procter & Gamble Company, The. Laundry additive product. 4,179,390, Cl. 252-95.000.

Spector, George: *See—*
Sur, Ferdinand; and Spector, George, 4,178,977, Cl. 150-52.00R.

Spencer, Anthony. Kiosk unit. 4,179,723, Cl. 361-384.000.

Sperry Rand Corporation: *See—*
Johnson, James S., 4,179,087, Cl. 244-175.000.
Nelson, Arthur R., 4,179,184, Cl. 350-96.140.

Spire Corporation: *See—*
Kirkpatrick, Allen R., 4,179,324, Cl. 156-230.000.

Splitt, Frank G.; Cwirzen, Casimir; Hines, William W.; and Ladd, Arnold M., to Cook Electric Company. Connector assembly for telephone distribution equipment. 4,179,170, Cl. 339-14.00R.

Spolgen, Hermann J.: *See—*
Schotten, Alfons; and Spolgen, Hermann J., 4,179,377, Cl. 210-230.000.

Sprengel, Heide: *See—*
Klupfel, Kurt-Walter; and Sprengel, Heide, 4,179,292, Cl. 430-175.000.

Square D Company: *See—*
Jorgensen, George N., 4,179,174, Cl. 339-22.00B.

Staats, Henry N.; Schmidt, Waldemar M.; and Davila, Efrain A., to General Binding Corporation. Apparatus for manufacturing adhesive covers. 4,179,325, Cl. 156-498.000.

Stafford, Jay H., to Conoco, Inc. Oil porting system for dual cylinder vibrator. 4,178,838, Cl. 92-117.00A.

Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning machine apparatus with a traveling device for bobbin exchange and method of using same. 4,178,748, Cl. 57-263.000.

Stahlecker, Fritz; and Stahlecker, Hans. Method and apparatus for execution of a piecing process. 4,178,749, Cl. 57-263.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,178,748, Cl. 57-263.000.
Stahlecker, Fritz; and Stahlecker, Hans, 4,178,749, Cl. 57-263.000.

Stahura, Daniel W.: *See—*
Cummins, Donald L.; and Stahura, Daniel W., 4,179,647, Cl. 320-6.000.

Standard Oil Company, a corporation of Indiana: *See—*
Bowman, Walker H.; and Sirovich, Bruce E., 4,178,987, Cl. 165-1.000.

Stanley Works, The: *See—*
MacFarlane, Walter J., 4,178,656, Cl. 16-93.00D.

Stanton, William E.; Eisenhaure, David B.; Oberbeck, George A.; and Fertig, Kenneth, to Charles Stark Draper Laboratory, Inc., The. Rotary electric machine and power conversion system using same. 4,179,729, Cl. 363-175.000.

Stanulonis, John J.: *See—*
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,179,358, Cl. 208-114.000.

Star Dental Manufacturing Co., Inc.: *See—*
Nash, John E., 4,178,689, Cl. 433-166.000.

Starks, Fred W.: *See—*
Schultz, Robert J.; and Starks, Fred W., 4,179,464, Cl. 260-502.500.

Stauffer Chemical Company: *See—*
Gutman, Arnold D., 4,179,523, Cl. 424-324.000.

Stauffer, Harry C.: *See—*
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,179,354, Cl. 208-89.000.
Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., 4,179,355, Cl. 208-89.000.

Steidinger, Donald J., to Wallace Business Forms, Inc. Form suitable for airline ticketing. 4,179,140, Cl. 282-11.50R.

Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, to Bayer Aktiengesellschaft. Stable alkylhydridopolysiloxane emulsions. 4,179,426, Cl. 260-29.20M.

Steinkuhl, Bernd: *See—*
Breuer, Oswald; and Steinkuhl, Bernd, 4,179,161, Cl. 299-34.000.

Stemme, Otto; Lermann, Peter; Engelsmann, Dieter; and Went, Werner, to AGFA-Gevaert, A.G. Casing. 4,179,028, Cl. 206-316.000.

Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., to Burroughs Wellcome Co. Quarternary ammonium compounds. 4,179,507, Cl. 424-258.000.

Stephens, Thomas P., to Portex, Inc. Visual indicator for cuff-type catheter. 4,178,939, Cl. 128-207.150.

Steppke, Dieter: *See*—
Seiz, Rudolf; Eickhoff, Heinz; Meyer, Herbert; and Steppke, Dieter, 4,178,859, Cl. 109-27.000.
Sterling Drug Inc.: *See*—
Clarke, Robert L.; and Daum, Sol J., 4,179,567, Cl. 546-124.000.
Stern, Howard K.: *See*—
Ross, Joseph A.; and Stern, Howard K., 4,179,228, Cl. 407-57.000.
Stern, Louis P.; and Johnson, Steven J., to Westinghouse Electric Corp. System for minimizing valve throttling losses in a steam turbine power plant. 4,178,763, Cl. 60-667.000.
Stern, Louis P.; and Johnson, Steven J., to Westinghouse Electric Corp. System for intelligently selecting the mode of control of a power plant. 4,179,742, Cl. 364-494.000.
Sternglass, Ernest J.: *See*—
Sashin, Donald; and Sternglass, Ernest J., 4,179,100, Cl. 250-416.0TV.
Stevens, Eloy C.; and Swain, Kenneth, to General Motors Corporation. Method of controlling turbomachine blade flutter. 4,178,667, Cl. 29-156.80B.
Still, Norman H.; and Berry, Robert W., Jr. Underground drilling and casing method and apparatus. 4,179,001, Cl. 175-57.000.
Stoepel, Kurt: *See*—
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.
Stohlquist, Roger H., to Anderson Bros. Mfg. Co. Wrapping machine with improved article depositing apparatus. 4,178,737, Cl. 53-550.000.
Storfossen, Asbjorn, to Kabmatik AB. Method for removing plating residues from a plated wire. 4,178,784, Cl. 72-47.000.
Stork Gamco, Inc.: *See*—
Simonds, Michael E., 4,178,659, Cl. 17-24.000.
Strathie, Richard T.: *See*—
Mill, Kenneth G.; Lynch, Christian P.; Strathie, Richard T.; and Dixon, Alexander F. H., 4,179,611, Cl. 235-92.0QC.
Strehl, Peter: *See*—
Kraus, Hubert; and Strehl, Peter, 4,179,615, Cl. 250-489.000.
Streich, Steven G., to Halliburton Company. Retrievable plug for offshore platforms. 4,178,967, Cl. 138-89.000.
Strem, R. C.: *See*—
Strem, Robert C.; Strem, R. C.; and Eberle, John H., 4,178,897, Cl. 123-122.00E.
Strem, Robert C.; Strem, R. C.; and Eberle, John H., to Omnewtronics, Inc. System and method of feeding gasoline fuel into an internal combustion engine. 4,178,897, Cl. 123-122.00E.
Strissel, Richard A.: *See*—
Khan, Sultan W.; Ham, John K.; and Strissel, Richard A., 4,179,732, Cl. 364-200.000.
Strom, John R.; Finch, George W.; and Weyrick, Harvey W., to Systematix Controls, Inc. Flow turbulence generating and mixing device. 4,179,222, Cl. 366-337.000.
Stuber, Richard A., to Tecumseh Products Company. Linear compressor. 4,179,630, Cl. 310-15.000.
Stutgens, Heribert: *See*—
Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, 4,179,306, Cl. 106-300.000.
Sugita, Toshikazu: *See*—
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, 4,179,295, Cl. 428-447.000.
Sugiura, Yasuo: *See*—
Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, 4,178,983, Cl. 164-113.000.
Sugiyama, Masatoshi; and Kato, Eiichi, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive element containing dye. 4,179,294, Cl. 430-522.00A.
Sulzer Brothers Ltd.: *See*—
Bieri, Hans, 4,178,991, Cl. 165-166.000.
Sumi, Etsuo, to Sumitomo Durez Company, Ltd. Process for treating waste water. 4,179,365, Cl. 210-8.000.
Sumitomo Chemical Company, Limited: *See*—
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.
Sumitomo Durez Company, Ltd.: *See*—
Sumi, Etsuo, 4,179,365, Cl. 210-8.000.
Sumitomo Electric Industries, Ltd.: *See*—
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.
Iizuka, Jinya; Kato, Seinosuke; and Matsuda, Akio, 4,178,868, Cl. 114-74.00R.
Sumitomo Metal Mining Company Limited: *See*—
Murakita, Seiichi; Ohta, Akio; and Narahara, Satoshi, 4,179,495, Cl. 423-531.000.
Sumitomo Naugatuck Co., Ltd.: *See*—
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.
Sun Electric Corporation: *See*—
Karlin, Richard A.; McDonald, Robert W.; and Comiskey, Gary F., 4,179,649, Cl. 320-13.000.
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, to Dainippon Ink & Chemicals Inc. Composition for water-base paint comprising water-soluble resin and water-dispersible polymer. 4,179,417, Cl. 260-18.0EP.
Sunday, Brooks R.: *See*—
Schwender, Charles F.; and Sunday, Brooks R., 4,179,509, Cl. 424-266.000.
Superior Concrete Accessories, Inc.: *See*—
Tye, Dennis W., 4,179,151, Cl. 294-89.000.
Superior Industries International, Inc.: *See*—
Brown, Raymond C., 4,179,163, Cl. 301-37.0SS.
Sur, Ferdinand; and Spector, George. Lawnmower cover. 4,178,977, Cl. 150-52.00R.
Sutherland, David T., to Virtis Company, The. Condensation chamber for freeze drying apparatus. 4,178,697, Cl. 34-92.000.
Suzuki, Koshiro: *See*—
Kasamatsu, Hiroshi; and Suzuki, Koshiro, 4,179,536, Cl. 427-239.000.
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Sound motion picture projection system. 4,179,197, Cl. 352-14.000.
Suzuki, Norio: *See*—
Ishiguro, Tatsuo; Suzuki, Norio; and Iijima, Yukihiko, 4,179,710, Cl. 358-135.000.
Suzuki, Takeomi; and Hayashi, Asao, to Olympus Optical Company, Ltd. Automatic microfilm retrieval system. 4,179,743, Cl. 364-518.000.
Suzuki, Takeshi. Bobbin holder. 4,179,082, Cl. 242-129.510.
Suzuki, Toyotosi: *See*—
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.
Suzuki, Tsutomu: *See*—
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.
Svarz, Jerry J., to Nalco Chemical Company. Removal of color from paper mill waste waters. 4,179,329, Cl. 162-29.000.
Swain, Kenneth: *See*—
Stevens, Eloy C.; and Swain, Kenneth, 4,178,667, Cl. 29-156.80B.
Swanson, Eugene S.; and Winters, Joel M., to Rockford Machine Tool Co. Pipe snapper machine and method. 4,178,673, Cl. 29-453.000.
Swartz, Peter J.; and Sostek, Ronald J. Vial cap opener device. 4,178,646, Cl. 7-156.000.
Sweat, James R., Jr. Unified hot water and forced air heating system. 4,178,907, Cl. 126-101.000.
Sweeney, William M., to Texaco Inc. Residual fuel compositions with low pour points. 4,178,950, Cl. 137-13.000.
Sweeney, William M., to Texaco Inc. Low pour point crude oil compositions. 4,178,951, Cl. 137-13.000.
Swenck, George F.: *See*—
Goolsby, Patrick F.; Laudig, David J.; Mechler, Paul A.; Osterhus, Steven J.; and Swenck, George F., 4,178,909, Cl. 126-417.000.
Swenson, Paul F.; and Moore, Paul B., to Consolidated Natural Gas Service Company, Inc. Heat pump system. 4,178,772, Cl. 62-238.000.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., to Gulf Research and Development Company. Fluid cracking catalyst process using a zeolite dispersed in a magnesia-alumina-aluminum phosphate matrix. 4,179,358, Cl. 208-114.000.
Swift, Harold E.: *See*—
Beuther, Harold; and Swift, Harold E., 4,179,474, Cl. 585-251.000.
Swinehart, Lonn L. Apparatus for use in cleaning vehicle tires. 4,178,948, Cl. 134-45.000.
Swiss Aluminium Ltd.: *See*—
Clumpner, Joseph A., 4,179,102, Cl. 266-218.000.
Systematix Controls, Inc.: *See*—
Strom, John R.; Finch, George W.; and Weyrick, Harvey W., 4,179,222, Cl. 366-337.000.
Szinicz, Gerhard; and Trawoger, Werner. Selectively operatable blocking device for tubular body organs. 4,178,915, Cl. 128-1.00R.
Szmuszkovicz, Jacob, to Upjohn Company, The. Analgesic N-(2-aminocycloaliphatic)azidobenzamides. 4,179,501, Cl. 424-226.000.
Szpak, Anthony D.: *See*—
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.
Szporny, Laszlo: *See*—
Kisfaludy, Lajos; Nyeki nee Kuprina, Olga; Skirmai nee Sarkozi, Maria; Karpati, Egon; Gidai, Katalin; and Szporny, Laszlo, 4,179,433, Cl. 260-112.50R.
Matolcsy, Gyorgy; Bartok, Piroska, nee Berencsy; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,463, Cl. 260-502.600.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bella; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,179,467, Cl. 260-563.00R.
Tackaberry, Robert B.: *See*—
Persson, Staffan B.; and Tackaberry, Robert B., 4,179,196, Cl. 351-30.000.
Tada, Tetsuya. Sprayer. 4,179,070, Cl. 239-333.000.
Taguchi, Tetsuya: *See*—
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.
Takahashi, Akifusa: *See*—
Nakauchi, Shunsaku; and Takahashi, Akifusa, 4,179,606, Cl. 250-339.000.
Takahashi, Akikazu: *See*—
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.

Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Photoelectrophoretic photography process involving dual corona treatments of opposite polarity. 4,179,290, Cl. 430-34.000.
Takahashi, Kazuya: *See*—
Fukushima, Isao; Asada, Akihiro; and Takahashi, Kazuya, 4,179,650, Cl. 323-1.000.
Takahashi, Michihisa: *See*—
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Takahashi, Nagashige. Apparatus for manipulating a medical instrument. 4,178,810, Cl. 74-501.00R.
Takamizawa, Minoru; Inoue, Yoshio; and Sugita, Toshikazu, to Shin-Etsu Chemical Co. Ltd. Organopolysiloxane containing planographic masters. 4,179,295, Cl. 428-447.000.
Takanashi, Hirotugu: *See*—
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.
Takaoka, Yukio: *See*—
Kurei, Hiroshi; Kawasaki, Masahiro; and Takaoka, Yukio, 4,179,201, Cl. 354-41.000.
Takase, Tsutomu: *See*—
Hanauye, Kunio; Takase, Tsutomu; and Morimoto, Yoshio, 4,179,429, Cl. 260-32.80R.
Takashashi, Kiyoshi: *See*—
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Takei, Haruo: *See*—
Sato, Akira; Iwamoto, Atsuo; Sakai, Takeo; and Takei, Haruo, 4,179,296, Cl. 430-574.000.
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, to Matsushita Electric Industrial Co., Ltd. Solar heating and cooling system. 4,178,989, Cl. 165-62.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.
Takimoto, Hiroyuki: *See*—
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.
Tamura Electric Works, Ltd.: *See*—
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.
Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; Tamura, Sadahiro; and Matsumoto, Haruo, 4,179,673, Cl. 333-204.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Ion-nitriding apparatus. 4,179,617, Cl. 250-531.000.
Tanaka, Akio; Edamura, Mizuo; Furuitsu, Satoshi; and Kunise, Satoru, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus for ion-nitriding treatment. 4,179,618, Cl. 250-531.000.
Tanaka, Hiroyoshi: *See*—
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.
Tanaka, Masaaki: *See*—
Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, 4,178,896, Cl. 123-119.00A.
Tanczyn, Harry, to Armco Inc. Ferritic stainless steel. 4,179,285, Cl. 75-126.00E.
Tang, Sunny C.: *See*—
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,402, Cl. 252-431.00C.
Kim, Leo; Paxson, Timm E.; and Tang, Sunny C., 4,179,403, Cl. 252-431.00C.
Tanikawa, Eiki: *See*—
Kudo, Daiziro; Maeda, Kazuo; and Tanikawa, Eiki, 4,179,326, Cl. 156-612.000.
Tanimoto, Akira; Masuzawa, Sigeaki; Shibata, Shinya; and Nishizaki, Shinzo, to Sharp Kabushiki Kaisha. Synthetic-speech calculators. 4,179,584, Cl. 179-1.0SM.
Tapecon, Inc.: *See*—
MacDonough, Francis X., 4,179,715, Cl. 360-61.000.
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, to Konishiroku Photo Industry Co., Ltd. Fixing apparatus for electrophotographic copying machine. 4,179,601, Cl. 219-216.000.
Tashiro, Isao, to Tokyo Shibaura Electric Co., Ltd. Signal transmission system. 4,179,659, Cl. 325-38.00B.
Tashkentsky Nauchno-Issledovatelsky I Proektny Institut Stroitelnykh Materialov "Niistromproekt": *See*—
Nudelman, Boris I.; Gadaev, Anatoly Y.; Bikbau, Marsel Y.; and Shishkin, Petr T., 4,179,302, Cl. 106-100.000.
Tateishi, Iwao, to Sharp Kabushiki Kaisha. Electronic digital scale. 4,178,691, Cl. 33-139.000.
Tateoka, Masamichi; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Device for scanning a light beam at a constant speed. 4,179,183, Cl. 350-6.100.
Tateshita, Tadao; Mita, Yasuhiro; Nakayama, Junichi; and Sato, Koichi, to Hitachi, Ltd. Method and apparatus for liquid supply. 4,179,242, Cl. 417-8.000.
Tawara, Ikuo: *See*—
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.
Taylor, Ernest E.: *See*—
Cooper, Thomas W.; and Taylor, Ernest E., 4,179,003, Cl. 175-371.000.
Taylor, Glenn N.; and Patel, Bhupendra C., to Kendall Company, The. Catheter with integral balloon and method. 4,178,937, Cl. 128-349.00B.
Tecumseh Products Company: *See*—
Stuber, Richard A., 4,179,630, Cl. 310-15.000.
Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See*—
Garrison, C. Gene; and Southern, William, 4,178,853, Cl. 102-27.00R.
Tenneco Chemicals, Inc.: *See*—
Ali, Asghar; Caruso, Robert; Fischer, Alfred; Deinet, Adolph J.; Minieri, Pasquale P.; and Sidi, Henri, 4,179,385, Cl. 252-33.000.
Tennis, Francis H., to Tomco, Inc. Control valve with flow control means. 4,178,962, Cl. 137-596.130.
Terada, Miyuki: *See*—
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.
Teradyne, Inc.: *See*—
Davis, Richard P., 4,179,652, Cl. 324-64.000.
Tesolin, Luciano. Pneumatically operated air lock for air ducts, particularly for air conditioning plants. 4,179,095, Cl. 251-30.000.
Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,179,575, Cl. 562-506.000.
Teter, Edward C., to Quaker Oats Company, The. Means for joining toy track sections. 4,179,066, Cl. 238-10.00E.
Texaco Development Corp.: *See*—
Waddill, Harold G., 4,179,418, Cl. 260-18.0PN.
Waddill, Harold G., 4,179,552, Cl. 528-111.000.
Texaco Inc.: *See*—
Paull, Peter L.; and McGann, Rodney, 4,178,758, Cl. 60-648.000.
Reinhard, Russell R.; and Yaffe, Roberta, 4,179,386, Cl. 252-46.600.
Sweeney, William M., 4,178,950, Cl. 137-13.000.
Sweeney, William M., 4,178,951, Cl. 137-13.000.
Vartanian, Paul F.; and Ippolito, Anthony L., 4,179,271, Cl. 44-62.000.
Texas Instruments Deutschland GmbH: *See*—
Schuermann, Josef H., 4,179,668, Cl. 330-277.000.
Texas Instruments Incorporated: *See*—
Tubbs, Graham S., 4,179,746, Cl. 364-900.000.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Single lens reflex camera with electromechanically initiated diaphragm and shutter control. 4,179,206, Cl. 354-152.000.
Thetford Corporation: *See*—
Coviello, Allan J.; Bernardin, Frederick E., Jr.; and Rohrkemper, Robert R., 4,179,616, Cl. 250-527.000.
Theurer, Josef; and Folser, Karl, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Self-propelled ballast cleaning machine for on- and off-track work. 4,178,995, Cl. 171-16.000.
Theurer, Josef; and Riessberger, Klaus. Apparatus for measuring the profile of a railroad tunnel. 4,179,216, Cl. 356-4.000.
Thir, Basil: *See*—
Newkirk, David D.; Thir, Basil; and Login, Robert B., 4,179,544, Cl. 428-395.000.
Thomann, Christoph. Method of and apparatus for the measuring of quantities of heat. 4,178,800, Cl. 73-190.00R.
Thomas, Michael D., to Ryder International Corporation. One-piece check valve for use in a fluid dispenser. 4,179,051, Cl. 222-494.000.
Thomas, Michael D.: *See*—
Ryder, Francis E.; and Thomas, Michael D., 4,178,932, Cl. 128-276.000.
Thomas, Wolfram: *See*—
Grundei, Hans; and Thomas, Wolfram, 4,178,641, Cl. 3-1.911.
Thompson, David A.: *See*—
Boyd, David C.; Hagy, Henry E.; and Thompson, David A., 4,179,638, Cl. 313-480.000.
Thomson-CSF: *See*—
Vasseur, Jean-Pierre, 4,179,663, Cl. 328-59.000.
Thomson, Donald W., to Lea-Ronal, Inc. Gold alloy plating compositions and method. 4,179,344, Cl. 204-44.000.
Thuillier, Germaine; Laforest, Jacqueline; and Bessin, Pierre, to Albert Rolland, S.A. Ethers of 3,4-dihydro-1-benzoxepin-5-one oxime to treat intestinal disorders. 4,179,516, Cl. 424-278.000.
Thym, Sabine; Koenig, Karl-Heinz; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. N-fluoromethyl-carbamic acid fluorides and their manufacture. 4,179,465, Cl. 260-544.00C.
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., to AB Bofors. Fluid pressure device for supporting and elevating a gun barrel. 4,178,831, Cl. 89-41.00H.
Tiffany, Peter A.: *See*—
Garner, Joseph L.; and Tiffany, Peter A., 4,179,546, Cl. 521-56.000.
Tilley, Martin C. Bale turner. 4,179,017, Cl. 193-47.000.
Tischlinger, Edward A. Self injector. 4,178,928, Cl. 128-215.000.
Tissmetal Lionel-Dupont: *See*—
Piette, Remi R.; and Hubert, Francois M. A., 4,179,025, Cl. 198-833.000.
Tjutjunnikov, Anatoly B.: *See*—
Chekhov, Oleg S.; Rybinsky, Alexandr G.; Tjutjunnikov, Anatoly B.; Solomakha, Gennady P.; and Dilman, Viktor V., 4,179,487, Cl. 261-114.00R.

Tokico Ltd.: *See*—
Miyazawa, Hiroshi, 4,179,092, Cl. 248-309.00R.
Tokyo Electric Power Co. Inc., The: *See*—
Shindo, Yoshio; Kimijima, Takahiro; Onishi, Hiroyasu; and Endo, Masayasu, 4,179,624, Cl. 307-3.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Tashiro, Isao, 4,179,659, Cl. 325-38.00B.
Yamazaki, Isamu, 4,179,731, Cl. 364-200.000.
Tolliday, Ian D.: *See*—
Spadini, Gianfranco L.; and Tolliday, Ian D., 4,179,390, Cl. 252-95.000.
Tom, Michael: *See*—
Quesinberry, Elmen C.; Tom, Michael; and Farrell, James L., 4,179,696, Cl. 343-7.400.
Tom Swift Enterprises, Inc.: *See*—
Reitz, Ronald P., 4,179,627, Cl. 307-261.000.
Tomari, Masao: *See*—
Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, 4,179,279, Cl. 75-24.000.
Tomco, Inc.: *See*—
Tennis, Francis H., 4,178,962, Cl. 137-596.130.
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, to Furukawa Electric Co., Ltd. Vulcanization apparatus for a continuous length of article of rubber, plastics or the like material. 4,179,256, Cl. 425-71.000.
Tomita, Tsutomu: *See*—
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Toro Company, The: *See*—
Lonn, Dana R.; and Jendersee, Melvin H., 4,178,741, Cl. 56-7.000.
Torrington Company, The: *See*—
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., 4,178,781, Cl. 66-121.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Mochizuki, Zenichi; Sugiura, Yasuo; and Kashiwagi, Nobuo, 4,178,983, Cl. 164-113.000.
Townsend, Robert L., to Sanders Associates, Inc. Tilt compensation for acoustic transducing system. 4,179,682, Cl. 367-135.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Adachi, Eiji; Shibatani, Juichi; and Ito, Sadayoshi, 4,178,756, Cl. 60-397.000.
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,178,666, Cl. 29-156.70R.
Horikoshi, Masafumi; Nohira, Hidetaka; and Tanaka, Masaaki, 4,178,896, Cl. 123-119.00A.
Konishi, Hiromu; and Nishiwaki, Kiyoshi, 4,179,164, Cl. 303-24.00F.
Matsuoka, Fumio, 4,179,136, Cl. 280-744.000.
Yanagihara, Hiromichi; and Miura, Nobuhiro, 4,178,903, Cl. 123-32.0SP.
Toyota Jidoshi Kogyo Kabushiki Kaisha: *See*—
Aoki, Keiji, 4,178,893, Cl. 123-117.00D.
Traenckner, Hans-Joachim: *See*—
Rosenkranz, Hans J.; Traenckner, Hans-Joachim; and Fuhr, Karl, 4,179,478, Cl. 525-113.000.
Trane Company, The: *See*—
Johnsen, Clifford N., 4,178,769, Cl. 62-180.000.
Trauger, Robert: *See*—
Lind, Gene C.; Lind, Ralph C.; Lind, Frank L.; Burchman, Edmund K.; and Trauger, Robert, 4,178,931, Cl. 128-230.000.
Trautner, Kersten: *See*—
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.
Trawoger, Werner: *See*—
Szinicz, Gerhard; and Trawoger, Werner, 4,178,915, Cl. 128-1.00R.
Tremain, Thomas E.: *See*—
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.
Tremmel, Robert A., to Oxy Metal Industries Corporation. Electroplating bath and process for producing bright, high-leveling nickel iron electrodeposits. 4,179,343, Cl. 204-43.00T.
Trexler, Charles H., Sr. Fireplace heating unit. 4,178,908, Cl. 126-121.000.
Tritten, Paul, to Ceraver. Bone prosthesis and method of manufacture thereof. 4,179,485, Cl. 264-44.000.
Trojer, Felix: *See*—
Kalbskopf, Reinhard; and Trojer, Felix, 4,179,535, Cl. 427-206.000.
Trotzmuller, Alfred: *See*—
Beckmann, Georg; and Trotzmuller, Alfred, 4,178,696, Cl. 34-13.000.
TRW, Inc.: *See*—
Jones, Robert J.; Green, Howard E.; and Quinlivan, Sandra C., 4,179,551, Cl. 526-262.000.
Tsao, Jung-Hsien; and Ketley, Arthur D., to W. R. Grace & Co. Process for preparing catalytic solutions of sulfonium salts. 4,179,400, Cl. 252-429.00R.
Tschudy, Donald B., to Hoover Company, The. Improved agitator chamber. 4,178,653, Cl. 15-383.000.
Tsen, Fan B.: *See*—
Tsen, John B.; and Tsen, Fan B., 4,178,714, Cl. 46-228.000.
Tsen, John B.; and Tsen, Fan B. Lighted and sounding toy. 4,178,714, Cl. 46-228.000.
Tsukamoto, Kenkichi. Phono cartridge. 4,179,589, Cl. 179-100.41D.
Tsukamoto, Yutaka: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,178,889, Cl. 123-75.00B.
Tsukuda, Mitsuo. Baseball game board. 4,179,123, Cl. 273-89.000.
Tsunefuji, Katsuhiko, to Olympus Optical Company, Ltd. Change-over switch for printed circuit board. 4,179,593, Cl. 200-292.000.
Tsushima, Susumu: *See*—
Numata, Mitsuo; Minamida, Isao; and Tsushima, Susumu, 4,179,502, Cl. 424-246.000.
Tubbs, Graham S., to Texas Instruments Incorporated. Digital processor system with conditional carry and status function in arithmetic unit. 4,179,746, Cl. 364-900.000.
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Turk, Gunter: *See*—
Kilian, Eberhard; Kreher, Alfons; Nauroth, Peter; and Turk, Gunter, 4,179,431, Cl. 260-42.370.
Turrentine, Fred C. Combined removable tiller extension holding and controlling device for watercraft. 4,178,869, Cl. 114-172.000.
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Felton, John C.; Badmin, John S.; and Twydell, Roland S., 4,179,518, Cl. 424-300.000.
Tye, Dennis W., to Superior Concrete Accessories, Inc. Anchor insert for embedment in a concrete slab. 4,179,151, Cl. 294-89.000.
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Ube Industries: *See*—
Ishikawa, Tatsuo, 4,178,984, Cl. 164-333.000.
Uchida, Yoshiro: *See*—
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.
Uchidoi, Masanori: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.
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Ueno, Kenji: *See*—
Tarumi, Noriyoshi; Ueno, Kenji; and Sakaguchi, Hirofumi, 4,179,601, Cl. 219-216.000.
Uhlmann, Helmut: *See*—
Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, 4,178,677, Cl. 29-605.000.
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, to Tamura Electric Works, Ltd.; and Yanashita Seiko Kabushiki Kaisha. Shutter type digital clocks. 4,178,752, Cl. 58-126.00E.
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Umstead, Herbert R., to Avon Products, Inc. Pump dispenser. 4,179,049, Cl. 222-631.000.
Union Carbide Corporation: *See*—
D'Silva, Themistocles D. J., 4,179,514, Cl. 424-277.000.
Jugle, Lawrence C.; Inderbitzen, Emil R.; and McDaniel, Paul W., 4,178,794, Cl. 73-28.000.
Kaelin, Joseph R., 4,179,366, Cl. 210-14.000.
Kosto, Timothy J., 4,179,287, Cl. 75-168.00E.
Maguire, David E., 4,179,725, Cl. 361-433.000.
Smarook, Walter H., 4,179,540, Cl. 428-71.000.
Union Oil Company of California: *See*—
Simpson, Howard D., 4,179,410, Cl. 252-465.000.
U.S. Automation Company: *See*—
Borodin, Daniel J., 4,178,662, Cl. 29-25.200.
United States of America
Agriculture: *See*—
Tumlinson, James H., III; Klein, Michael G.; Doolittle, Robert E.; and Ladd, Thyril L., Jr., 4,179,446, Cl. 260-343.600.
Air Force: *See*—
Friedman, Jerome D.; and Pitha, Carl A., 4,179,190, Cl. 350-152.000.
Hobbs, Charles F., 4,179,657, Cl. 325-33.000.
Yamada, Edwin Y., 4,179,086, Cl. 244-122.0AG.
Army: *See*—
Bitzer, David R., 4,179,658, Cl. 325-34.000.
Brady, Joseph F., 4,178,851, Cl. 102-4.000.
Conrad, Raymond W., 4,179,599, Cl. 219-121.00P.

Crowell, Robert B., 4,178,832, Cl. 89-159.000.
French, John A., 4,179,088, Cl. 244-3.190.
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.
Miller, Walter E., Jr., 4,179,085, Cl. 244-3.110.
Energy: *See—*
Park, Jang Y., 4,179,349, Cl. 204-195.00R.
Walenta, Albert H., 4,179,608, Cl. 250-385.000.
Navy: *See—*
Christou, Aristos; and Day, Howard M., 4,179,533, Cl. 427-84.000.
Christou, Aristos, 4,179,604, Cl. 250-305.000.
Fletcher, Paul C.; and Soltan, Parviz, 4,178,708, Cl. 40-451.000.
Forman, Donald B.; and Holma, Gary M., 4,178,722, Cl. 51-170.00T.
Geller, Myer; Altman, Daniel E.; and Barstow, Glidden J., 4,179,194, Cl. 350-356.000.
McVay, James V.; and Yates, Patrick A., 4,178,855, Cl. 102-262.000.
Sergev, Sergius S., 4,179,583, Cl. 174-21.00R.
Zehner, William J.; and Warner, Henry L., 4,179,681, Cl. 367-110.000.
U.S. Philips Corporation: *See—*
Janssen, Eduard J. P., 4,179,636, Cl. 313-274.000.
Peeters, Peter M. J., 4,179,655, Cl. 324-132.000.
Sharp, Denis; and Skoyles, Derek R., 4,179,166, Cl. 303-119.000.
van de Plassche, Rudy J.; and Dijkmans, Eise C., 4,179,687, Cl. 340-347.0AD.
United States Steel Corporation: *See—*
Ruff, James W., 4,178,789, Cl. 72-209.000.
University of Pittsburgh: *See—*
Sashin, Donald; and Sternglass, Ernest J., 4,179,100, Cl. 250-416.0TV.
UOP Inc.: *See—*
Antos, George J., 4,179,405, Cl. 252-441.000.
Antos, George J., 4,179,406, Cl. 252-442.000.
Flagg, John F.; and Antos, George J., 4,179,360, Cl. 208-139.000.
Hayes, John C.; and Pollitzer, Ernest L., 4,179,359, Cl. 208-139.000.
Imai, Tamotsu, 4,179,469, Cl. 260-577.000.
Mitsche, Roy T.; and Pope, George N., 4,179,581, Cl. 585-744.000.
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,179,356, Cl. 208-111.000.
O'Hara, Mark J.; and Johnson, Russell W., 4,179,357, Cl. 208-111.000.
Upjohn Company, The: *See—*
Curtiss, John N.; Koehler, Charles E.; and Murray, Pat L., 4,179,094, Cl. 249-82.000.
Dankert, Harry S., 4,178,733, Cl. 53-331.500.
McCall, John M., 4,179,510, Cl. 424-267.000.
Szmuszkovicz, Jacob, 4,179,501, Cl. 424-226.000.
Urwin, John: *See—*
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.
Vadetec Corporation: *See—*
Kemper, Yves J.; and Bigot, Lucien, 4,178,812, Cl. 74-745.000.
Valenti, Salvatore: *See—*
Fleck, Fritz; Kittl, Hans; and Valenti, Salvatore, 4,179,578, Cl. 560-76.000.
Valleylab: *See—*
Lundquist, Ingemar H., 4,178,927, Cl. 128-214.00F.
Valmet Oy: *See—*
Ilmoniemi, Erkki; and Kokkonen, Olavi, 4,179,332, Cl. 162-380.000.
Van Antwerp, Ferne; and Murdy, Raymond R. Bale loader. 4,179,034, Cl. 414-551.000.
Vancauwenberghe, Gerard R., to Dicalite Europe Nord, S.A. Method for expanding perlite. 4,179,264, Cl. 432-13.000.
Vance, Dwight A. Apparatus to indicate when a patient has evacuated a bed or demonstrates a restless condition. 4,179,692, Cl. 340-573.000.
Van Daele, Georges H. P.: *See—*
Janssen, Paul A. J.; and Van Daele, Georges H. P., 4,179,569, Cl. 546-223.000.
van de Plassche, Rudy J.; and Dijkmans, Eise C., to U.S. Philips Corporation. Analog-to-digital converter circuit employing iterative subtraction. 4,179,687, Cl. 340-347.0AD.
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Vanderhoek, Naphthali N.; Nelson, Peter F.; and Farrington, Alan, to Australia Paper Manufacturers Limited. Method for the delignification of lignocellulosic material in an amine delignifying liquor containing a quinone or hydroquinone compound. 4,178,861, Cl. 162-72.000.
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van der Lely, Cornelis. Soil cultivating machine. 4,178,996, Cl. 172-59.000.
Van Es, Theodorus: *See—*
Davis, Frank F.; Van Es, Theodorus; and Palczuk, Nicholas C., 4,179,337, Cl. 435-181.000.
Van Gelder, Josephus L. H.: *See—*
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.
Van Hemeldonck, Lodewijk L.: *See—*
Raeymaekers, Alfons H. M.; Van Gelder, Josephus L. H.; Boeckx, Gustaaf M.; and Van Hemeldonck, Lodewijk L., 4,179,505, Cl. 424-250.000.
Varian Associates, Inc.: *See—*
Chan, Edwin T.; and Jepson, Stanley R., 4,179,037, Cl. 220-2.30R.
Vartanian, Paul F.; and Ippolito, Anthony L., to Texaco Inc. Amine oxide polymers and use thereof as fuel detergent. 4,179,271, Cl. 44-62.000.
Vasilevsky, Petr N.: *See—*
Gekhman, Boris S.; Vasilevsky, Petr N.; Ediny, Jury G.; Parfinenko, Ivan V.; and Podgursky, Alfred M., 4,178,935, Cl. 128-328.000.
Vasiliev, Viktor V.: *See—*
Antonov, Boris M.; Vasiliev, Viktor V.; and Pischikov, Sergei I., 4,179,730, Cl. 364-105.000.
Vasseur, Jean-Pierre, to Thomson-CSF. Devices for generating pseudo-random sequences. 4,179,663, Cl. 328-59.000.
Vassos, Louis J., to Skil Corporation. Power tool switch including speed control. 4,179,644, Cl. 318-17.000.
Vater, Wulf: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.
Veld, Ralph, Jr.: *See—*
Sieklucki, James F.; and Veld, Ralph, Jr., 4,179,159, Cl. 297-192.000.
Ventavoli, Roger: *See—*
Birat, Jean-Pierre; and Ventavoli, Roger, 4,178,979, Cl. 164-49.000.
Vereinigte Oesterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Hacker, Hermann; and Zehenthofer, Waldemar, 4,179,023, Cl. 198-631.000.
Verghese, George T., to Firestone Tire & Rubber Company, The. Method of applying and adhereing lubricant to a tire inner tube as it is formed. 4,179,321, Cl. 156-118.000.
Vertut, Jean: *See—*
Francois, Daniel; Germond, Jean-Claude; Marchal, Paul; and Vertut, Jean, 4,179,035, Cl. 414-2.000.
Vetter, Hans; and Marx, Paul, to AGFA-Gevaert, A.G. Photographic dye diffusion transfer process. 4,179,291, Cl. 430-223.000.
Vetter, Heinz, to Rohm GmbH. Method of lubricating a thermoplastic resin strand for sliding contact in a reshaping device. 4,179,529, Cl. 427-44.000.
Vianova Kunstharz, A.G.: *See—*
Pampouchidis, Georgios; and Honig, Helmut, 4,179,425, Cl. 260-29.6NR.
Zuckert, Bertram; Schmut, Wolfgang; and Behmel, Klaus, 4,179,428, Cl. 260-29.40R.
Victor United, Inc.: *See—*
Groner, Norman A., 4,178,905, Cl. 124-23.00R.
Vidinghoff, Bjorn E.: *See—*
Tidemalm, Gustav H.; and Vidinghoff, Bjorn E., 4,178,831, Cl. 89-41.00H.
Vilgertshofer, August: *See—*
Schmieder, Lothar; Vilgertshofer, August; and Mettin, Florian, 4,178,799, Cl. 73-141.00A.
Virgilio, Douglas R.; Campbell, Robert G.; Fortunato, Alfred J.; and Benson, Carl F., to Torrington Company, The. Knitting needle. 4,178,781, Cl. 66-121.000.
Virnot, Alain D. Memory controlled process for railraod traffic management. 4,179,739, Cl. 364-436.000.
Virtis Company, The: *See—*
Sutherland, David T., 4,178,697, Cl. 34-92.000.
Vissers, Hermanus H.: *See—*
Oosterling, Pieter A.; and Vissers, Hermanus H., 4,179,073, Cl. 239-659.000.
Vitins, Michael, to BBC Brown Boveri & Company Limited. Method and apparatus for supervising an electrical line for short circuits. 4,179,651, Cl. 324-51.000.
Vitous, Charles J., to Cory Food Services, Inc. Cantilevered instantaneous heating brewer. 4,178,842, Cl. 99-281.000.
Vock, Manfred H.: *See—*
Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., 4,179,526, Cl. 426-535.000.
Vockenhuber, Karl: *See—*
Freudenschuss, Otto; Keznickl, Eduard; and Patels, Gottfried, 4,179,191, Cl. 350-187.000.
Freudenschuss, Otto; and Kittag, Gerd, 4,179,713, Cl. 360-27.000.
Voegele, Guenther, to Robert Bosch GmbH. Dosing device for germ-free measurements and filling of liquid material. 4,178,929, Cl. 128-213.00R.
Vofsi, David: *See—*
Allingham, Yael; Vofsi, David; and Gassner, Saul A., 4,179,547, Cl. 525-2.000.
Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Method for making pyrazolo[1,5-c]quinazoline derivatives and related compounds. 4,179,561, Cl. 544-250.000.
Vogt, Berthold R.: *See—*
Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold R., 4,179,564, Cl. 546-64.000.
Voles, Roger, to E M I Limited. Phase modulation system for combining carrier wave segments containing selected phase transitions. 4,179,672, Cl. 332-16.00R.
Volker, James W., to Scott & Fetzer Company, The. Crankcase vent apparatus and method. 4,179,246, Cl. 417-313.000.
Volkswagenwerk Aktiengesellschaft: *See—*
Dau, Wolfram, 4,178,955, Cl. 137-264.000.
Huisman, Marinus, 4,179,156, Cl. 296-137.00B.

Voll, Manfred: *See—*
Rothbuhr, Lothar; and Voll, Manfred, 4,179,494, Cl. 423-456.000.
von der Eltz, Hans-Ulrich: *See—*
Birke, Walter; von der Eltz, Hans-Ulrich; and Schon, Franz, 4,178,705, Cl. 38-144.000.
Von Genk, Richard A.: *See—*
Kane, Bernard J.; and Von Genk, Richard A., 4,179,468, Cl. 260-567.60M.
von Strandtmann, Max: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,179,447, Cl. 260-345.200.
Vorontsov, Leonid F.: *See—*
Belitsin, Mikhail N.; Kudryashov, Sergei A.; Borik, Alexandr G.; Kulikov, Valentin V.; Sadkova, Natalia A.; Kudryashova, Galina A.; and Vorontsov, Leonid F., 4,179,259, Cl. 425-461.000.
Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Malasek, Jaromir; Kuda, Vladimir; and Bucek, Miroslav, 4,178,971, Cl. 139-435.000.
W. R. Grace & Co.: *See—*
Hein, Paul R.; and Irvin, Robert A., 4,179,531, Cl. 430-300.000.
Milner, Burl D., 4,179,055, Cl. 225-80.000.
Sanchez, Moises G.; Ernest, Michael V.; and Laine, Norman R., 4,179,408, Cl. 252-448.000.
Tsao, Jung-Hsien; and Ketley, Arthur D., 4,179,400, Cl. 252-429.00R.
Waagner-Biro A.G.: *See—*
Beckmann, Georg; and Trotzmuller, Alfred, 4,178,696, Cl. 34-13.000.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Koppl, Franz; Hamster, Helmut; Griesshammer, Rudolf; and Lorenz, Helmut, 4,179,530, Cl. 427-51.000.
Wada, Fumio: *See—*
Fujita, Yoshiji; Wada, Fumio; Ohnishi, Takashi; Nishida, Takashi; Omura, Yoshiaki; Mori, Fumio; Hosogai, Takeo; and Aihara, Sukeji, 4,179,579, Cl. 568-840.000.
Waddill, Harold G., to Texaco Development Corp. Water-based epoxy resin coating composition. 4,179,418, Cl. 260-18.0PN.
Waddill, Harold G., to Texaco Development Corp. Process for accelerated cure of epoxy resins. 4,179,552, Cl. 528-111.000.
Waddoups, Ray O.: *See—*
Levine, Arnold M.; and Waddoups, Ray O., 4,179,695, Cl. 343-6.50R.
Wagatsuma, Kazuo: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,179,437, Cl. 260-239.100.
Wagner, Raymond L., to Burlington Industries, Inc. Determination of average speed of rotation of a cyclically loaded shaft during periods of up to two minutes duration. 4,179,656, Cl. 324-166.000.
Wahlco, Inc.: *See—*
Kozacka, Wayne R., 4,179,071, Cl. 239-397.500.
Waigh, Roger D.: *See—*
Stenlake, John B.; Waigh, Roger D.; Dewar, George H.; Urwin, John; and Dhar, Nirmal C., 4,179,507, Cl. 424-258.000.
Wakabayashi, Toru: *See—*
Ono, Katsuya; Nakamura, Takashi; and Wakabayashi, Toru, 4,179,281, Cl. 75-35.000.
Wakamatsu, Nobuhiko: *See—*
Takeshita, Isao; Wakamatsu, Nobuhiko; Ando, Eiji; Tanaka, Hiroyoshi; and Hozumi, Shiro, 4,178,989, Cl. 165-62.000.
Wakeman, Alden H., to Crepaco, Inc. Material handling system. 4,178,773, Cl. 62-341.000.
Walenta, Albert H., to United States of America, Energy. Right/left assignment in drift chambers and proportional multiwire chambers (PWC's) using induced signals. 4,179,608, Cl. 250-385.000.
Wallace Business Forms, Inc.: *See—*
Steidinger, Donald J., 4,179,140, Cl. 282-11.50R.
Wallace, Charles H., to International Telephone and Telegraph Corporation. Lift device arrangement. 4,179,021, Cl. 198-341.000.
Wallace Murray Corporation: *See—*
Shepherd, Michael, 4,178,811, Cl. 74-574.000.
Wallshein, Melvin. Clamp, particularly for orthodontia. 4,178,687, Cl. 433-13.000.
Walsh, Adam J., to Reynolds Metals Company. Coating system method for coloring aluminum. 4,179,342, Cl. 204-35.00N.
Ward, Frances S.; and Ward, John J. Two-way adjustable cooking grid. 4,178,844, Cl. 99-449.000.
Ward, John J.: *See—*
Ward, Frances S.; and Ward, John J., 4,178,844, Cl. 99-449.000.
Ward, Stephen W., to NCR Corporation. Document dispensing system. 4,179,031, Cl. 209-534.000.
Wardt, Volker; and Gantevoort, Heinz L. Gas-heating appliance. 4,179,262, Cl. 431-354.000.
Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Lung-controlled membrane valve for compressed gas respirators. 4,178,961, Cl. 137-495.000.
Warner, Henry L.: *See—*
Zehner, William J.; and Warner, Henry L., 4,179,681, Cl. 367-110.000.
Warner-Lambert Company: *See—*
Brown, Richard E., 4,179,513, Cl. 424-274.000.
Butler, Donald E., 4,179,506, Cl. 424-256.000.
Butler, Donald E., 4,179,563, Cl. 544-360.000.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,179,447, Cl. 260-345.200.
Schwender, Charles F.; and Sunday, Brooks R., 4,179,509, Cl. 424-266.000.
Warner & Swasey Company, The: *See—*
Holmstrom, Paul E., 4,178,834, Cl. 409-80.00C.
Wasynczuk, Victor: *See—*
Wolynec, John J.; Hildebrand, Donald L.; and Wasynczuk, Victor, 4,178,647, Cl. 15-84.000.
Watanabe, Hideo: *See—*
Iiyama, Kiyotaka; Matsui, Takeshi; Kusakata, Shigeru; Watanabe, Hideo; and Takahashi, Michihisa, 4,179,407, Cl. 252-446.000.
Watanabe, Hisao; and Etoh, Terukazu, to Nihon Denshi Kabushiki Kaisha. Cold trap for electron microscope. 4,179,605, Cl. 250-311.000.
Watanabe, Masao: *See—*
Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, 4,178,890, Cl. 123-103.00R.
Watanabe, Satoshi: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.
Watson, Gary Q. Method and apparatus for protecting thread on an earth anchor. 4,178,726, Cl. 52-98.000.
Way, Lee V., Jr. Separable hinge. 4,178,657, Cl. 16-173.000.
Wear-Ever Aluminum, Inc.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.
Webb, R. Britton: *See—*
McCoskey, J. Marion; and Webb, R. Britton, 4,178,823, Cl. 84-1.010.
Weber, Alfred; Kennecke, Mario; and Dahl, Helmut, to Schering Aktiengellschaft. Microbiological degradation of sterol side chains to a 17-keto group. 4,179,336, Cl. 435-55.000.
Weber-Knapp Company: *See—*
Little, Carl H., 4,178,655, Cl. 16-52.000.
Wehinger, Egbert: *See—*
Junge, Bodo; Bossert, Friedrich; Meyer, Horst; Wehinger, Egbert; Vater, Wulf; Heise, Arend; Kazda, Stanislav; and Stoepel, Kurt, 4,179,500, Cl. 424-180.000.
Wehrmuller, Beat; and Wienenga, Paul, to BBC Brown, Boveri & Company Limited. Circuit for driving and braking a speed-controlled direct current motor. 4,179,645, Cl. 318-139.000.
Weiden, Otto: *See—*
Steinbach, Hans-Horst; Schnurrbusch, Karl; Rieder, Matthias; and Weiden, Otto, 4,179,426, Cl. 260-29.20M.
Weigel, Horst; and Muller, Karl, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for direct recovery of metal from metal-bearing ores. 4,179,284, Cl. 75-92.000.
Weiler, Gerhard H.; Nagel, Dieter H.; and Pagels, Louis T., to Automatic Liquid Packaging, Inc. Unitary, hermetically-sealed but pierceable dispensing container. 4,178,976, Cl. 150-0.500.
Weisberg, Warren. High impact strength partially liquid filled bag. 4,179,027, Cl. 206-205.000.
Weiss, Martin J.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,179,574, Cl. 562-503.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; McGahren, William J.; and Schaub, Robert E., 4,179,451, Cl. 260-395.000.
Weisse, Hanns-Jorg; Jager, Wilhelm; and Uhlmann, Helmut, to Siemens Aktiengesellschaft. Superconducting magnet assembly and method of making. 4,178,677, Cl. 29-605.000.
Welsch, Walter N.: *See—*
Fleckenstein, Elwin H.; and Welsch, Walter N., 4,178,723, Cl. 51-170.0EB.
Went, Werner: *See—*
Stemme, Otto; Lermann, Peter; Engelsmann, Dieter; and Went, Werner, 4,179,028, Cl. 206-316.000.
Wessel, Wolf, to Robert Bosch GmbH. Method and apparatus for measuring fuel consumption in internal combustion engines. 4,178,798, Cl. 73-113.000.
West, Neil L., to Deere & Company. Rotor for an axial flow rotary separator. 4,178,943, Cl. 130-27.00T.
Western Electric Co., Inc.: *See—*
Artz, Walter M.; Bauer, Charles R.; and Moyer, Paul W., 4,179,032, Cl. 209-538.000.
Lindenborg, Jon M., 4,179,666, Cl. 330-138.000.
Lyon, Jarrel D., 4,178,680, Cl. 29-751.000.
Western, William J. T. Moulding apparatus. 4,179,093, Cl. 249-65.000.
Westinghouse Electric Corp.: *See—*
Binstock, Morton H.; and Johnson, Steven J., 4,178,762, Cl. 60-667.000.
Coyle, Forrest E.; and Mandel, Alan F., 4,179,594, Cl. 200-310.000.
Felice, Patrick E.; Gonzalez, Joseph L.; and Seidel, John G., 4,179,614, Cl. 250-253.000.
Gerkey, Kenneth S., 4,178,787, Cl. 72-122.000.
Kothmann, Richard E., 4,179,240, Cl. 416-96.00R.
Larson, Daniel A.; and Zollweg, Robert J., 4,179,640, Cl. 315-47.000.
Oehler, Harry G., 4,179,626, Cl. 307-238.000.
Quesinberry, Elmen C.; Tom, Michael; and Farrell, James L., 4,179,696, Cl. 343-7.400.
Sahasrabudhe, Arun P.; and Kapadia, Jayant K., 4,179,629, Cl. 307-311.000.
Stern, Louis P.; and Johnson, Steven J., 4,178,763, Cl. 60-667.000.
Stern, Louis P.; and Johnson, Steven J., 4,179,742, Cl. 364-494.000.

Westvaco Corporation: *See—*
Gilbert, Earl F., 4,179,061, Cl. 229-27.000.

Weyrick, Harvey W.: *See—*
Strom, John R.; Finch, George W.; and Weyrick, Harvey W., 4,179,222, Cl. 366-337.000.

Wheelock, Kenneth S.: *See—*
Gladrow, Elroy M.; and Wheelock, Kenneth S., 4,179,409, Cl. 252-455.00Z.

Whirlpool Corporation: *See—*
Heybey, Otfried W. G., 4,179,680, Cl. 338-25.000.

Whitaker Cable Corporation: *See—*
Lowden, Lawrence C., 4,179,179, Cl. 339-186.00M.

White Consolidated Industries, Inc.: *See—*
Hoffman, Robert E.; Williams, Richard B.; and Wright, Carl J., 4,178,957, Cl. 137-387.000.

White, E. Gurney, deceased (by Williams, Robert G., executor), to Nabisco, Inc. Process for manufacturing a whole wheat food product. 4,179,527, Cl. 426-620.000.

White Farm Equipment Company: *See—*
Ketterling, Edwin; and Nelson, Benjamin R., 4,178,757, Cl. 60-548.000.

White, Jack M., to ACF Industries, Incorporated. Fail safe bypass valve. 4,178,953, Cl. 137-116.000.

Wienenga, Paul: *See—*
Wehrmuller, Beat; and Wienenga, Paul, 4,179,645, Cl. 318-139.000.

Wiese, John R.: *See—*
Hance, Richard J.; and Wiese, John R., 4,179,309, Cl. 136-234.000.

Wijts, Corneel C.: *See—*
Persoons, Gustaaf M.; and Wijts, Corneel C., 4,178,743, Cl. 56-12.900.

Wikle, Keith G., to Kawecki Berylco Industries, Inc. Treatment of beryllium-copper alloy and articles made therefrom. 4,179,314, Cl. 148-12.70C.

Wilder, Alvin D.: *See—*
Losee, David L.; and Wilder, Alvin D., 4,179,528, Cl. 427-9.000.

Wilhite, John E., to Honeywell Information Systems Inc. Microprogrammed computer control unit capable of efficiently executing a large repertoire of instructions for a high performance data processing unit. 4,179,736, Cl. 364-200.000.

Williams, Albert L.: *See—*
Heiba, El-Ahmadi I.; and Williams, Albert L., 4,179,392, Cl. 252-108.000.

Williams, Alfred S.; and Foskett, Raymond. Scaffolding. 4,179,090, Cl. 248-235.000.

Williams, Chalmer. Light apparatus for fishing rod. 4,178,712, Cl. 43-17.000.

Williams, Dwight E.: *See—*
Hines, Charles E.; and Williams, Dwight E., 4,178,860, Cl. 111-7.000.

Williams, Richard B.: *See—*
Hoffman, Robert E.; Williams, Richard B.; and Wright, Carl J., 4,178,957, Cl. 137-387.000.

Williams, Robert A.: *See—*
Crabtree, Steven B.; Groth, Hugh F.; Hunt, Guilbert M.; Lipinski, Thomas E.; McMaster, James T.; Moffitt, Guy R., Jr.; Szpak, Anthony D.; and Williams, Robert A., 4,178,843, Cl. 99-323.800.

Williams, Robert G., executor: *See—*
White, E. Gurney, deceased, 4,179,527, Cl. 426-620.000.

Williams, Stanley H. Rotary edge cutter. 4,178,747, Cl. 56-256.000.

Willis, Roderick M. G-factor compensated hydraulic flocculation system. 4,179,368, Cl. 210-42.00R.

Wilson, Robert W., to Powell Manufacturing Company, Inc. Tobacco handling apparatus. 4,178,745, Cl. 56-27.500.

Winnard, James R.: *See—*
Keller, John H.; McKenna, Charles M.; and Winnard, James R., 4,179,312, Cl. 148-1.500.

Winters, Joel M.: *See—*
Swanson, Eugene S.; and Winters, Joel M., 4,178,673, Cl. 29-453.000.

Wischmeyer, Georg: *See—*
Tuschy, Eckhard; and Wischmeyer, Georg, 4,178,785, Cl. 72-78.000.

Withycombe, Donald A.; Hruza, Anne; Vock, Manfred H.; Giacino, Christopher; Mookherjee, Braja D.; Pittet, Alan O.; and Schreiber, William L., to International Flavors & Fragrances Inc. Uses of α-substituted alkylidene methionals in foodstuffs and flavors for foodstuffs. 4,179,526, Cl. 426-535.000.

Wittmann, Klaus: *See—*
Grocke, Diethelm W. K.; and Wittmann, Klaus, 4,179,022, Cl. 198-437.000.

Woditsch, Peter; Bayer, Eckhard; Panek, Peter; and Stutgens, Heribert, to Bayer Aktiengesellschaft. Stabilizing titanium dioxide pigments with vanadates. 4,179,306, Cl. 106-300.000.

Wolf, Gerard. Skipping rope or wire. 4,179,119, Cl. 272-75.000.

Wolford, John W. Power tube for flared bell musical instruments. 4,178,829, Cl. 84-386.000.

Wolfrum, Gerhard: *See—*
Hugl, Herbert; Schundehutte, Karl H.; Trautner, Kersten; and Wolfrum, Gerhard, 4,179,436, Cl. 260-206.000.

Wolynec, John J.; Hildebrand, Donald L.; and Wasynczuk, Victor, to Elgin Sweeper Company. Four-wheeled sweeper. 4,178,647, Cl. 15-84.000.

Woodford Manufacturing Company: *See—*
Fillman, Russell L., 4,178,956, Cl. 137-360.000.

Woods, Weightstill W.: *See—*
Gillette, Roger B.; and Woods, Weightstill W., 4,179,193, Cl. 350-295.000.

Woodville Lime & Chemical Company: *See—*
Judd, George G., 4,179,490, Cl. 423-165.000.

Woolley, Ronald L.: *See—*
Anderson, Vaughn R.; Woolley, Ronald L.; and Davis, Edward H., 4,178,882, Cl. 123-1.00A.

Worby, Donald, to Lucas Industries Limited. Fuel injector. 4,179,072, Cl. 239-533.900.

Workman, Dennis L., to Bell & Howell Company. Video information bandwidth compression. 4,179,709, Cl. 358-133.000.

Wright, Carl J.: *See—*
Hoffman, Robert E.; Williams, Richard B.; and Wright, Carl J., 4,178,957, Cl. 137-387.000.

Wrightson, John C., to Heritage Quilts Inc. Filled body robe. 4,178,637, Cl. 2-69.500.

WRR Industries, Inc.: *See—*
Osborn, Norbert L., 4,179,247, Cl. 417-406.000.

Wuertele, James W., to Gentran, Inc. Thermocouple linearizer circuit. 4,179,745, Cl. 364-571.000.

Wynblatt, Paul P.: *See—*
Gandhi, Haren S.; Shelef, Mordecai; and Wynblatt, Paul P., 4,179,413, Cl. 252-472.000.

Wynne, Francis E., Jr.: *See—*
Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., 4,179,355, Cl. 208-89.000.

Xerox Corporation: *See—*
Agulnek, Martin A., 4,179,620, Cl. 250-566.000.
Crean, Peter A.; Lavallee, Pierre A.; and Agulnek, Martin A., 4,179,621, Cl. 250-566.000.
Goren, Robert N., 4,179,209, Cl. 355-3.00P.
Lahr, Roy J., 4,179,212, Cl. 355-14.00R.
Rahn, Arthur W.; Jones, Lewis O.; and Lu, Chin H., 4,179,388, Cl. 430-108.000.

Yaffe, Roberta: *See—*
Reinhard, Russell R.; and Yaffe, Roberta, 4,179,386, Cl. 252-46.600.

Yajima, Masamichi: *See—*
Hara, Ryoichi; Yajima, Masamichi; Akai, Chiaki; and Matsumoto, Takuzo, 4,179,083, Cl. 242-158.00R.

Yam, Vladimir M.: *See—*
Karas, Genrikh E.; Lebedeva, Ljudmila P.; Mukhin, Anatoly A.; Pivovarov, Anatoly D.; Skrynnikov, Vladimir I.; Yam, Vladimir M.; Oleinik, Vladimir T.; Miroshnichenko, Vladimir V.; Kovtun, Vasily A., deceased; Kovtun, Lidia P., administrator; Soshnikova, Inna V., administrator; and Kovtun, Sergei V., administrator, 4,179,258, Cl. 425-352.000.

Yamabe, Hitoshi; Otaka, Syoichi; and Watanabe, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Deceleration control apparatus for vehicle engine. 4,178,890, Cl. 123-103.00R.

Yamada, Edwin Y., to United States of America, Air Force, Army restraint system. 4,179,086, Cl. 244-122.0AG.

Yamada, Shigeru: *See—*
Aoki, Eiichiro; and Yamada, Shigeru, 4,178,824, Cl. 84-1.190.

Yamada, Tateo: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takashashi, Kiyoshi; and Takimoto, Hiroyuki, 4,179,197, Cl. 352-14.000.

Yamaga, Eiichi: *See—*
Hiyoshi, Teruo; Nakada, Akira; Suzuki, Tsutomu; Aoki, Eiichiro; and Yamaga, Eiichi, 4,178,826, Cl. 84-1.260.

Yamaguchi, Akihide: *See—*
Akado, Hajime; Uchida, Yoshiro; Kubota, Kenichi; Hasebe, Toshiharu; Yamaguchi, Akihide; Tomita, Tsutomu; Ootsubo, Suminobu; and Toyota Jidosha Kogyo Kabushiki Kaisha, 4,178,898, Cl. 123-122.00D.

Yamaguti, Sakan: *See—*
Miyama, Masao; Yamaguti, Sakan; and Kusama, You, 4,179,541, Cl. 428-165.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Iida, Kazumi, 4,178,887, Cl. 123-73.00V.

Yamamichi, Masayoshi: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Watanabe, Satoshi; Yamamichi, Masayoshi; and Aizawa, Hiroshi, 4,179,206, Cl. 354-152.000.

Yamamoto, Harushige, to Niles Parts Co., Ltd. Apparatus for indicating quantity of fuel of a vehicle. 4,178,802, Cl. 73-313.000.

Yamamoto, Hisao: *See—*
Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, 4,179,560, Cl. 544-250.000.

Yamamoto, Katsuo: *See—*
Tomioka, Shoji; Nakao, Toshiaki; Nakamura, Hisatsugu; Mine, Nobuyoshi; Yamamoto, Katsuo; Fukushima, Seiji; and Nogami, Akira, 4,179,256, Cl. 425-71.000.

Yamamoto, Michihiro; Morooka, Shigeaki; Koshiba, Masao; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Imidazo- and pyrimido[2,1-b]quinazolines and preparation thereof. 4,179,560, Cl. 544-250.000.

Yamamoto, Takaya: *See—*
Sakai, Kazuo; Akiba, Shigeyuki; and Yamamoto, Takaya, 4,179,317, Cl. 148-171.000.

Yamanaka, Seisuke: *See—*
Nishimura, Toshimichi; Yamanaka, Seisuke; and Shimada, Masaru, 4,179,706, Cl. 358-44.000.

Yamane, Hiroshi: *See—*
Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., 4,179,064, Cl. 235-381.000.

Yamazaki, Isamu, to Tokyo Shibaura Electric Co., Ltd. Microprogrammed control system. 4,179,731, Cl. 364-200.000.

Yamazaki, Masami: *See—*
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,178,666, Cl. 29-156.70R.

Yanagida, Hiroaki; Shimizu, Tadao; and Nishikawa, Yasuo, to Kyushu Refractories Co., Ltd. Fibrous crystalline potassium titanate and processes for preparing fibrous potassium titanates. 4,179,496, Cl. 423-598.000.

Yanagida, Tuneo: *See—*
Satoh, Ken; and Yanagida, Tuneo, 4,179,716, Cl. 360-74.300.

Yanagihara, Hiromichi; and Miura, Nobuhiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with an auxiliary combustion chamber. 4,178,903, Cl. 123-32.0SP.

Yanashita, Fumio: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.

Yanashita Seiko Kabushiki Kaisha: *See—*
Umezaki, Hideo; Doma, Katsuharu; Konno, Toshiro; Yanashita, Fumio; Saito, Yoshio; and Sawafuji, Tosuke, 4,178,752, Cl. 58-126.00E.

Yang, Yin-Lung: *See—*
Shyu, Ji Y., 4,178,867, Cl. 114-39.000.

Yanik, Stephen J.: *See—*
Frayer, James A.; Stauffer, Harry C.; and Yanik, Stephen J., 4,179,354, Cl. 208-89.000.
Frayer, James A.; Stauffer, Harry C.; Wynne, Francis E., Jr.; and Yanik, Stephen J., 4,179,355, Cl. 208-89.000.

Yascheritsyn, Petr I.; Borisenko, Alexandr V.; Sidorenko, Valery A.; and Serebryakov, Evgeny A., to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR. Method of cutting solids of revolution by a rotary tool having circular cutting lip, and a rotary tool for carrying same into effect. 4,178,818, Cl. 82-36.00R.

Yates, Patrick A.: *See—*
McVay, James V.; and Yates, Patrick A., 4,178,855, Cl. 102-262.000.

Yates, Willard L.; and Lee, Floyd W. Synthetic log production. 4,179,269, Cl. 44-10.00B.

Yeda Research and Development Co. Ltd.: *See—*
Allingham, Yael; Vofsi, David; and Gassner, Saul A., 4,179,547, Cl. 525-2.000.

Yen, Takuma: *See—*
Harada, Genzaburo; Yen, Takuma; and Tomari, Masao, 4,179,279, Cl. 75-24.000.

Ying, Sui-chun; and Cooper, Glen D., to Electric Power Research Institute. Sliding support for a superconducting generator rotor. 4,178,777, Cl. 64-13.000.

Yissum Research Development Company of the Hebrew University of Jerusalem: *See—*
Mechoulam, Raphael; Lander, Naphtali; Dikstein, Shabtay; and Shalita, Benyamin, 4,179,517, Cl. 424-283.000.

Yokota, Hideo: *See—*
Hirohata, Michio; Suzuki, Toyotosi; Yokota, Hideo; Matsuda, Mutsuhide; Taguchi, Tetsuya; and Sanada, Noriaki, 4,179,203, Cl. 354-106.000.

Yoshida, Hirohiko; and Nakajima, Fumio, to Citizen Watch Company Limited. Capacitor switching circuits for adjusting crystal oscillator frequency. 4,179,671, Cl. 331-116.0FE.

Yoshida, Isao: *See—*
Sakano, Hajime; Kawagishi, Shigemitsu; Kodama, Mikio; Ito, Akitoshi; Shoji, Toshihiro; Terada, Miyuki; and Yoshida, Isao, 4,179,341, Cl. 204-20.000.

Yoshida, Kohsaku: *See—*
Hara, Kunio; and Yoshida, Kohsaku, 4,178,669, Cl. 29-412.000.

Yoshikado, Shoji: *See—*
Kimura, Hiroshi; Kitagawa, Takaich; Hisajima, Masahiko; Yoshikado, Shoji; and Aizawa, Tatsuo, 4,179,211, Cl. 355-14.00R.

Yoshinaga, Makoto: *See—*
Sogi, Shinroku; Yoshinaga, Makoto; Shinohara, Toshio; Aihara, Takayuki; and Tawara, Ikuo, 4,179,339, Cl. 435-292.000.

Yoshinari, Hideki: *See—*
Kosugi, Masao; and Yoshinari, Hideki, 4,179,110, Cl. 270-58.000.

Yoshino, Fumio: *See—*
Sunada, Masuyuki; Takanashi, Hirotugu; Ishikawa, Hidenobu; Takahashi, Akikazu; and Yoshino, Fumio, 4,179,417, Cl. 260-18.0EP.

Yoshino Kogyosho Co., Ltd.: *See—*
Nishikawa, Masanori; and Hattori, Masao, 4,179,488, Cl. 264-521.000.

Yoshino, Kozi: *See—*
Hanzawa, Hisashi; and Yoshino, Kozi, 4,178,809, Cl. 74-483.0PB.

Yoshioka, Toshihiro; Ishimoto, Tasuku; Yamane, Hiroshi; Kita, Takahiro; and Matsushita Reiki Corp., Ltd., to Matsushita Electric Industrial Co., Ltd. Vending apparatus. 4,179,064, Cl. 235-381.000.

Yost, Neal E. Soffit nail set. 4,179,058, Cl. 227-147.000.

Young, James W., to Dresser Industries, Inc. Variable hydraulic resistor jarring tool. 4,179,002, Cl. 175-297.000.

Young, Kenneth: *See—*
Rudkin, Arthur L.; Clint, John H.; and Young, Kenneth, 4,179,382, Cl. 252-8.800.

Young, Patricia A.: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,179,447, Cl. 260-345.200.

Young, Timothy T. J. Adapter for receiprocal lever friction drive mechanism for unidirection drive. 4,178,807, Cl. 74-217.00B.

Young, William, to Davy International (Oil & Chemicals) Limited. Blending flowable solid materials. 4,179,234, Cl. 414-268.000.

Youngstown Steel Door Company, The: *See—*
Madland, Thorvald, 4,178,857, Cl. 105-378.000.

Zaccagnino, Nicholas: *See—*
Kwan, Okun; and Zaccagnino, Nicholas, 4,179,223, Cl. 400-320.000.

Zahid, Abduz, to Greer Hydraulics, Inc. Pulsation dampener device. 4,178,965, Cl. 138-30.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,179,573, Cl. 562-444.000.

Zaidlin, Mark M.: *See—*
Matviets, Petr P.; Makhtjuk, Iosif L.; Grigoriev, Valentin I.; Zaidlin, Mark M.; Khotilin, Alexandr I.; Krasnov, Jury N.; and Khaimovich, Isaak R., 4,178,792, Cl. 72-436.000.

Zarlengo, Dominic A. Water saving device for toilet. 4,178,644, Cl. 4-426.000.

Zarlengo, Dominic A. Dynamic wheel balancing system. 4,179,162, Cl. 301-5.0BA.

Zatti, Piergentino: *See—*
Bianchi, Nereo; and Zatti, Piergentino, 4,178,862, Cl. 112-121.110.

Zehenthofer, Waldemar: *See—*
Hacker, Hermann; and Zehenthofer, Waldemar, 4,179,023, Cl. 198-631.000.

Zehner, William J.; and Warner, Henry L., to United States of America, Navy. Target tracking sonar signal processing and display system. 4,179,681, Cl. 367-110.000.

Zeigler, Jon G.; Kerr, Elmer L.; and Bell, David V., to Electric Furnace Company, The. Radial blade heating device. 4,179,603, Cl. 219-538.000.

Zeigler, Philip B.: *See—*
Lura, Loren E.; and Zeigler, Philip B., 4,179,167, Cl. 308-189.00A.

Zeis, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Method and device for transmitting pulse-duration modulated signals using two oscillators. 4,179,660, Cl. 325-59.000.

Zelazny, David M. Construction board game. 4,179,128, Cl. 273-243.000.

Ziegler, John S.: *See—*
Cawood, Charles D., Jr.; and Ziegler, John S., 4,178,920, Cl. 128-4.000.

Zielinski, Richard J.: *See—*
Mehta, Anil B.; and Zielinski, Richard J., 4,179,454, Cl. 260-409.000.

Zmurko, Myron T.: *See—*
Mathews, Mitford M., Jr., deceased; Tremain, Thomas E.; and Zmurko, Myron T., 4,179,586, Cl. 179-1.50R.

Zollweg, Richard T.; and Eaton, Homer L., to Eaton-Leonard Corporation. Adjustable clamp die. 4,178,788, Cl. 72-154.000.

Zollweg, Robert J.: *See—*
Larson, Daniel A.; and Zollweg, Robert J., 4,179,640, Cl. 315-47.000.

Zuckerman, Ira: *See—*
Grimm, Harold; and Zuckerman, Ira, 4,179,108, Cl. 270-31.000.

Zuckert, Bertram; Schmut, Wolfgang; and Behmel, Klaus, to Vianova Kunstharz, A.G. Process for producing water-emulsifiable paint binders for stoving paints. 4,179,428, Cl. 260-29.40R.

Zung, Joseph T. Circulating air building heating system. 4,179,065, Cl. 237-51.000.

Zwicker, James D.; and Dube, Ghyslain, to Alcan Research and Development Limited. Method and apparatus for particle size analysis. 4,178,796, Cl. 73-61.400.

Zwingman, Robert L., to Burroughs Corporation. Defect tolerant scheme for a bubble lattice file. 4,179,749, Cl. 365-3.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF DECEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ahmed, Adel A. A., to RCA Corporation. Current mirror amplifier. Re. 30,173, Cl. 330-257.000.

Burroughs Corporation: *See—*
Saxon, Richard A., Re. 30,172, Cl. 315-169.400.

Flynn, John H. Method of drying coated webs. Re. 30,169, Cl. 427-224.000.

Goodman, Murray; and Kirshenbaum, Gerald S., to Sutures, Inc. Hydrolyzable polymers of amino acid and hydroxy acids. Re. 30,170, Cl. 528-327.000.

Hewlett-Packard Company: *See—*
Kruger, William P.; and Michnowicz, John A., Re. 30,171, Cl. 250-423.00R.

Kirshenbaum, Gerald S.: *See—*
Goodman, Murray; and Kirshenbaum, Gerald S., Re. 30,170, Cl. 528-327.000.

Kruger, William P.; and Michnowicz, John A., to Hewlett-Packard Company. Multiconfiguration ionization source. Re. 30,171, Cl. 250-423.00R.

Mason, Henry L., to Precision Plastic Industries Inc. End plug for rolled materials. Re. 30,168, Cl. 206-413.000.

Michnowicz, John A.: *See—*
Kruger, William P.; and Michnowicz, John A., Re. 30,171, Cl. 250-423.00R.

Precision Plastic Industries Inc.: *See—*
Mason, Henry L., Re. 30,168, Cl. 206-413.000.

RCA Corporation: *See—*
Ahmed, Adel A. A., Re. 30,173, Cl. 330-257.000.

Saxon, Richard A., to Burroughs Corporation. Circuit for operating a bar graph display panel. Re. 30,172, Cl. 315-169.400.

Schedler, Walter J. Sound simulator for model steam engine. Re. 30,174, Cl. 340-384.00E.

Stahlecker, Fritz; and Stahlecker, Hans. Apparatus and method for start-spinning on an open-end spinning machine. Re. 30,167, Cl. 57-263.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, Re. 30,167, Cl. 57-263.000.

Sutures, Inc.: *See—*
Goodman, Murray; and Kirshenbaum, Gerald S., Re. 30,170, Cl. 528-327.000.

LIST OF DESIGN PATENTEES

Acro Incorporated: *See—*
Robinson, Mark L.; and Brefka, Paul E., 253,713, Cl. D21-212.000.

Alcala, Amancio, to Three Phoenix Company. Automatic diskette loader. 253,702, 12-18-79, Cl. D14-46.000.

Allen, Donald G. Medication carrier. 253,722, 12-18-79, Cl. D24-56.000.

Anderson, Walter C., to General Electric Company. Electric make-up mirror or similar article. 253,728, 12-18-79, Cl. D28-67.000.

Bardeau, William M. Electric self contained kettle. 253,706, 12-18-79, Cl. D15-104.000.

Bljumshtein, Zigmund G.; and Kosheverov, Oleg A. Pressure gauge. 253,690, 12-18-79, Cl. D10-85.000.

Bljumshtein, Zigmund G.; Bychkin, Lev A.; and Ivanshin, Nikolai S. Pressure gauge. 253,691, 12-18-79, Cl. D10-85.000.

Boyd, Donald A.; and Gale, Allen W., to Cardinal American Corporation. Fireplace heater. 253,718, 12-18-79, Cl. D23-95.000.

Brefka, Paul E.: *See—*
Robinson, Mark L.; and Brefka, Paul E., 253,713, Cl. D21-212.000.

Browne, Michelle E. Aquarium. 253,730, 12-18-79, Cl. D30-9.000.

Bychkin, Lev A.: *See—*
Bljumshtein, Zigmund G.; Bychkin, Lev A.; and Ivanshin, Nikolai S., 253,691, Cl. D10-85.000.

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Boyd, Donald A.; and Gale, Allen W., 253,718, Cl. D23-95.000.

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Clevett, Mildred L.: *See—*
Clevett, Merton L.; and Clevett, Mildred L., 253,684, Cl. D7-109.000.

Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 253,710, Cl. D21-78.000.

Concept Inc.: *See—*
Simmons, Raymond W., 253,733, Cl. D48-24.00A.

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Rothstein, Estelle G., 253,681, Cl. D7-39.000.
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Boyd, Donald A.; and Gale, Allen W., 253,718, Cl. D23-95.000.

Gem Products, Inc.: *See—*
Wooldridge, Darrel; and McKinnon, Eugene T., 253,686, Cl. D8-312.000.

Genaro, Donald M.: *See—*
Felix, Christian J.; Genaro, Donald M.; and Illes, Stephen J., 253,705, Cl. D15-69.000.

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Anderson, Walter C., 253,728, Cl. D28-67.000.

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Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 253,710, Cl. D21-78.000.

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Schuman, April A.; Hoole, Wilfred G.; and Harrison, Larry S., 253,726, Cl. D28-46.000.

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Howard, John, to Reliance Products Ltd. Becket. 253,734, 12-18-79, Cl. D21-255.000.

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Nichols, Stephen A.; and Chuboff, David P., 253,698, Cl. D13-12.000.
Illes, Stephen J.: *See*—
Felix, Christian J.; Genaro, Donald M.; and Illes, Stephen J., 253,705, Cl. D15-69.000.
Interlego AG: *See*—
Christiansen, Godtfred K.; and Knudsen, Jens N., 253,711, Cl. D21-166.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Hanashima, Taira, 253,710, Cl. D21-78.000.
Ivanshin, Nikolai S.: *See*—
Bljumshtein, Zigmund G.; Bychkin, Lev A.; and Ivanshin, Nikolai S., 253,691, Cl. D10-85.000.
Janes, Richard: *See*—
Chartier, Donald A.; and Janes, Richard, 253,707, Cl. D15-199.000.
Jaros, Ronald D.; and Leone, Ernest J. Display stand. 253,680, 12-18-79, Cl. D6-146.000.
Johnson & Johnson: *See*—
Millet, Marcus J., 253,720, Cl. D24-25.000.
Katz, Arthur E. Holster. 253,714, 12-18-79, Cl. D22-13.000.
Klipsch and Associates, Inc.: *See*—
Gillum, Gary C., 253,700, Cl. D14-35.000.
Klipsch and Associates, Inc. of Hope, Arkansas: *See*—
Gillum, Gary C., 253,699, Cl. D14-33.000.
Knudsen, Jens N.: *See*—
Christiansen, Godtfred K.; and Knudsen, Jens N., 253,711, Cl. D21-166.000.
Kosheverov, Oleg A.: *See*—
Bljumshtein, Zigmund G.; and Kosheverov, Oleg A., 253,690, Cl. D10-85.000.
Kosmider, Ronald T.: *See*—
Fannon, Ronald A.; and Kosmider, Ronald T., 253,687, Cl. D10-59.000.
Kowal, Adolf. Disposable razor. 253,727, 12-18-79, Cl. D28-46.000.
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Leight, Howard S. Ear plug. 253,723, 12-18-79, Cl. D24-67.000.
Leone, Ernest J.: *See*—
Jaros, Ronald D.; and Leone, Ernest J., 253,680, Cl. D6-146.000.
Lighthouse Industries, Inc.: *See*—
Lange, Gordon R., 253,692, Cl. D10-109.000.
Louis Gibeck AB: *See*—
Gibeck, Sten G., 253,721, Cl. D24-52.000.
Lubke, Karl, to Lubke KG. Swivel chair. 253,677, 12-18-79, Cl. D6-31.000.
Lubke, Karl, to Lubke KG. Chair. 253,679, 12-18-79, Cl. D6-66.000.
Lubke KG: *See*—
Lubke, Karl, 253,677, Cl. D6-31.000.
Lubke, Karl, 253,679, Cl. D6-66.000.
Mankau, Dieter, to Rollei-Werke Franke & Heidecke. Photographic slide projector. 253,708, 12-18-79, Cl. D16-21.000.
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Martin, Leslie A.: *See*—
Martin, Anneliese; and Martin, Leslie A., 253,725, Cl. D27-07.000.
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McKinnon, Eugene T.: *See*—
Wooldridge, Darrel; and McKinnon, Eugene T., 253,686, Cl. D8-312.000.
Millet, Marcus J., to Johnson & Johnson. Syringe plunger tip. 253,720, 12-18-79, Cl. D24-25.000.
Mitutoyo Manufacturing Company, Ltd.: *See*—
Tanada, Tetsunori, 253,689, Cl. D10-73.000.
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Hillmer, Robert E.; Chadwick, Donald T.; and Tyson, John F., 253,703, Cl. D14-65.000.
Primus Mfg., Inc.: *See*—
Culver, Irven H.; and Szymber, Oleg, 253,688, Cl. D10-70.000.
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Howard, John, 253,734, Cl. D21-255.000.
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Frost, George H., 253,717, Cl. D23-28.000.
Schuman, April A.; Hoole, Wilfred G.; and Harrison, Larry S. Razor. 253,726, 12-18-79, Cl. D28-46.000.
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Simmons, James. Mobile broiler. 253,695, 12-18-79, Cl. D12-22.000.
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Felix, Christian J.; Genaro, Donald M.; and Illes, Stephen J., 253,705, Cl. D15-69.000.
Spitz, Russell W. Valve spool. 253,716, 12-18-79, Cl. D23-19.000.
Suzuki, Yasunori, to Yasui Sangyo Co. Ltd. Hydraulic lifting jack. 253,696, 12-18-79, Cl. D12-55.000.
Szymber, Oleg: *See*—
Culver, Irven H.; and Szymber, Oleg, 253,688, Cl. D10-70.000.
Tanada, Tetsunori, to Mitutoyo Manufacturing Company, Ltd. Micrometer head. 253,689, 12-18-79, Cl. D10-73.000.
Thomsen Equipment Company: *See*—
McGraw, John T., 253,704, Cl. D15-7.000.
Three Phoenix Company: *See*—
Alcala, Amancio, 253,702, Cl. D14-46.000.
Tomy Kogyo Co., Inc.: *See*—
Shiraishi, Masami, 253,709, Cl. D19-62.000.
TRW: *See*—
Woods, Thomas H., 253,701, Cl. D14-42.000.
Tyson, John F.: *See*—
Hillmer, Robert E.; Chadwick, Donald T.; and Tyson, John F., 253,703, Cl. D14-65.000.
Van Koert, John. Combined candleholder and centerpiece or the like. 253,732, 12-18-79, Cl. D48-2.000.
Vecta Contract, Inc.: *See*—
Gibilterra, Charles A., 253,678, Cl. D6-56.000.
Vogler, Norbert: *See*—
Marolt, George R.; and Vogler, Norbert, 253,712, Cl. D21-199.000.
Ward, Nazareen. Aquarium or similar article. 253,729, 12-18-79, Cl. D30-6.000.
Woods, Thomas H., to TRW. Automated teller terminal. 253,701, 12-18-79, Cl. D14-42.000.
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Suzuki, Yasunori, 253,696, Cl. D12-55.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

69.5 4,178,637

CLASS 3

1.5 4,178,638
4,178,639
1.91 4,178,640
1.911 4,178,641
28 4,178,642
36 4,178,643

CLASS 4

426 4,178,644

CLASS 5

4,178,645

CLASS 7

156 4,178,646

CLASS 8

41 R 4,179,267
137 4,179,268

CLASS 15

84 4,178,647
97 B 4,178,648
104.06 R 4,178,649
120 R 4,178,650
250.32 4,178,651
302 4,178,652
383 4,178,653
385 4,178,654

CLASS 16

52 4,178,655
86 A 4,178,658
93 D 4,178,656
173 4,178,657

CLASS 17

24 4,178,659
42.1 4,178,660

CLASS 24

130 4,178,661

CLASS 29

25.2 4,178,662
78 4,178,663
130 4,178,664
156.7 R 4,178,666
156.8 B 4,178,667
157.1 R 4,178,665
237 4,178,668
412 4,178,669
417 4,178,670
429 4,178,671
430 4,178,672
453 4,178,673
566.1 4,178,675
571 4,178,674
599 4,178,676
605 4,178,677
625 4,178,678
715 4,178,679
751 4,178,680

CLASS 30

151 4,178,681
250 4,178,682
276 4,178,683
344 4,178,684
381 4,178,685

CLASS 33

139 4,178,691
174 G 4,178,690
182 4,178,692
265 4,178,693
289 4,178,694

CLASS 34

5 4,178,695
13 4,178,696
92 4,178,697

CLASS 35

8 A 4,178,698
10 4,178,699
23 R 4,178,700
42.5 4,178,701

CLASS 36

59 R 4,178,702
110 4,178,703

CLASS 37

57 4,178,704

CLASS 38

144 4,178,705

CLASS 40

326 4,178,706
426 4,178,707
451 4,178,708
471 4,178,709
530 4,178,710

CLASS 43

1 4,178,711
17 4,178,712
18 GF 4,178,713

CLASS 44

13 B 4,179,269
40 4,179,270
62 4,179,271

CLASS 46

228 4,178,714

CLASS 47

58 4,178,715

CLASS 49

70 4,178,717
411 4,178,718

CLASS 51

103 TF 4,178,719
124 L 4,178,720
139 4,178,721
170 EB 4,178,723
170 T 4,178,722
178 4,178,724
290 4,178,725

CLASS 52

98 4,178,726
173 R 4,178,727
232 4,178,728
284 4,178,729
514 4,178,730
520 4,178,731
648 4,178,736
663 4,178,738

CLASS 53

309 4,178,732
331.5 4,178,733
399 4,178,734
473 4,178,735
550 4,178,737
556 4,178,740
588 4,178,739

CLASS 54

80 4,178,742

CLASS 55

1 4,179,272
457 4,179,273
524 4,179,274

CLASS 56

7 4,178,741
12.9 4,178,743
16.2 4,178,744
27.5 4,178,745
53 4,178,746
256 4,178,747

CLASS 57

263 Re.30,167
4,178,748
4,178,749

CLASS 58

4 A 4,178,750
23 R 4,178,751
126 E 4,178,752
152 R 4,178,753

CLASS 60

39.03 4,178,754
290 4,178,755
319 4,178,760
397 4,178,756
548 4,178,757
648 4,178,758
4,178,761
667 4,178,762
4,178,763
721 4,178,759

CLASS 62

81 4,178,764
83 4,178,765
88 4,178,766
155 4,178,767
160 4,178,768
180 4,178,769
186 4,178,770
200 4,178,771
238 4,178,772
341 4,178,773
493 4,178,774
514 JT 4,178,775
538 4,178,776

CLASS 64

13 4,178,777
21 4,178,778

CLASS 65

20 4,179,275

CLASS 66

54 4,178,779
115 4,178,780
121 4,178,781

CLASS 68

5 D 4,178,782

CLASS 70

422 4,178,783

CLASS 71

91 4,179,276
92 4,179,277

CLASS 72

47 4,178,784
78 4,178,785
117 4,178,786
122 4,178,787
154 4,178,788
209 4,178,789
224 4,178,790
388 4,178,791
436 4,178,792

CLASS 73

23 4,178,793
28 4,178,794
61 LM 4,178,795
61.4 4,178,796
104 4,178,797
113 4,178,798
141 A 4,178,799
190 R 4,178,800
195 4,178,801
313 4,178,802
425.6 4,178,803
702 4,178,804

CLASS 74

6 4,178,805
17.8 4,178,806
217 B 4,178,807
230.17 E 4,178,808
483 PB 4,178,809
501 R 4,178,810
574 4,178,811
745 4,178,812
764 4,178,813
781 R 4,178,814
805 4,178,815

CLASS 75

11 4,179,278
24 4,179,279
33 4,179,280
35 4,179,281
4,179,282
40 4,179,283
92 4,179,284
126 E 4,179,285
134 N 4,179,286
168 E 4,179,287
172 G 4,179,288
206 4,179,289

CLASS 81

57.13 4,178,817
57.3 4,178,816

CLASS 82

36 R 4,178,818
38 A 4,178,819

CLASS 83

13 4,178,820

CLASS 84

1.01 4,178,821
4,178,822
4,178,823
1.19 4,178,824
1.24 4,178,825
1.26 4,178,826
291 4,178,827
337 4,178,828
386 4,178,829
388 4,178,830

CLASS 89

41 H 4,178,831
159 4,178,832
163 4,178,833

CLASS 91

375 A 4,178,835
381 4,178,836
387 4,178,837

CLASS 92

117 A 4,178,838

CLASS 93

53 SD 4,178,839

CLASS 98

38 E 4,178,840
98 4,178,841

CLASS 99

281 4,178,842
323.8 4,178,843
449 4,178,844

CLASS 100

11 4,178,845

CLASS 101

5 4,178,846
91 4,178,847
142 4,178,848
305 4,178,849
451 4,178,850

CLASS 102

4 4,178,851
24 R 4,178,852
27 R 4,178,853
89 CD 4,178,854
262 4,178,855

CLASS 104

95 4,178,856

CLASS 105

378 4,178,857

CLASS 106

1.12 4,179,297
18.21 4,179,298
44 4,179,299
47 Q 4,179,300
73.5 4,179,301
100 4,179,302
119 4,179,303
177 4,179,304
292 4,179,305
300 4,179,306

CLASS 108

150 4,178,858

CLASS 109

27 4,178,859

CLASS 111

7 4,178,860

CLASS 112

121.11 4,178,862
158 D 4,178,863
159 4,178,864
261 4,178,865
278 4,178,866

CLASS 114

39 4,178,867
74 R 4,178,868
172 4,178,869
230 4,178,870
275 4,178,871

CLASS 115

72 4,178,872
73 4,178,873

CLASS 116

28 R 4,178,874

CLASS 118

681 4,178,876
712 4,178,875
728 4,178,877

CLASS 119

3 4,178,878
106 4,178,879

CLASS 122

182 S 4,178,880
235 A 4,178,881

CLASS 123

1 A 4,178,882
32 EE 4,178,883
4,178,884
32 SP 4,178,903
44 C 4,178,885
73 A 4,178,886
73 V 4,178,887
4,178,888
75 B 4,178,889
103 R 4,178,890
117 D 4,178,893
117 R 4,178,891
4,178,892
119 A 4,178,896
119 B 4,178,894
119 F 4,178,895
122 D 4,178,898
122 E 4,178,897
193 P 4,178,899
198 D 4,178,901
231 4,178,902
244 4,178,900

CLASS 124

23 R 4,178,904
4,178,905

CLASS 126

6 4,178,906
101 4,178,907
121 4,178,908
417 4,178,909
424 4,178,913
442 4,178,910
449 4,178,911
4,178,914
452 4,178,912

CLASS 128

1 R 4,178,915
4 4,178,920
58 4,178,921
78 4,178,922
4,178,923
82 4,178,924
83.5 4,178,925
133 4,178,926
207.15 4,178,938
4,178,939
4,178,940
213 R 4,178,929
214 F 4,178,927
215 4,178,928
4,178,930
230 4,178,931
276 4,178,932
284 4,178,933
295 4,178,934
328 4,178,935
349 B 4,178,936
4,178,937
665 4,178,917
682 4,178,918
719 4,178,919
734 4,178,916
763 4,178,941

CLASS 130

23 4,178,942
27 R 4,178,944
27 T 4,178,943

CLASS 131

23 R 4,178,945
135 4,178,946

CLASS 132

92 R 4,178,947

CLASS 134

45 4,178,948
58 D 4,179,307
167 R 4,178,949

CLASS 136

89 GA 4,179,308
234 4,179,309

CLASS 137

13 4,178,950
4,178,951
38 4,178,952
116 4,178,953
119 4,178,954
264 4,178,955
360 4,178,956
387 4,178,957
460 4,178,958
493.3 4,178,959
494 4,178,960
495 4,178,961
596.13 4,178,962
624.18 4,178,963
625.4 4,178,964

CLASS 138

30 4,178,965
89 4,178,966
4,178,967
126 4,178,968

CLASS 139

1 R 4,178,969
30 4,178,970
435 4,178,971

CLASS 140

105 4,178,972
123.6 4,178,973

CLASS 141

51 4,178,974
362 4,178,975

CLASS 147

62 4,178,716

CLASS 148

1.5 4,179,310
4,179,311
4,179,312
3 4,179,313
12.7 C 4,179,314
113 4,179,315
152 4,179,316
171 4,179,317
187 4,179,318

CLASS 150

0.5 4,178,976
52 R 4,178,977

CLASS 156

86 4,179,319
4,179,320
118 4,179,321
192 4,179,322
201 4,179,323
230 4,179,324
498 4,179,325
612 4,179,326
667 4,179,327

CLASS 159

16 R 4,179,328

CLASS 160

321 4,178,978

CLASS 162

29 4,179,329
72 4,178,861
113 4,179,330
156 4,179,331
380 4,179,332

CLASS 164

49 4,178,979
66 4,178,980
72 4,178,981
85 4,178,982
113 4,178,983
250 4,178,985
251 4,178,986
333 4,178,984

CLASS 165

1 4,178,987
2 4,178,988
62 4,178,989
134 R 4,178,990
166 4,178,991

CLASS 166

117.6 4,178,992
300 4,178,993

CLASS 169

52 4,178,994

CLASS 171

16 4,178,995

CLASS 172

59 4,178,996
112 4,178,997
311 4,178,998
702 4,178,999

CLASS 174

15 BH 4,179,582
21 R 4,179,583

CLASS 175

53 4,179,000
57 4,179,001
297 4,179,002
371 4,179,003

CLASS 177

211 4,179,004
212 4,179,005

CLASS 179

1 E 4,179,585
1 SM 4,179,584
1.5 R 4,179,586
15 AT 4,179,587
90 K 4,179,588
100.41 D 4,179,589
156 A 4,179,590
179 4,179,591

CLASS 180

10 4,179,006
65 DD 4,179,007

CLASS 181

147 4,179,008
171 4,179,009

CLASS 182

2 4,179,010
45 4,179,011

CLASS 187

12 4,179,012

CLASS 188

26 4,179,013
43 4,179,014
106 P 4,179,015

CLASS 192

4 A 4,179,016

CLASS 193

47 4,179,017

CLASS 194

4 R 4,179,018

CLASS 195

30 4,179,334

CLASS 196

46.1 4,179,019

CLASS 198

326 4,179,020
341 4,179,021
437 4,179,022
631 4,179,023
806 4,179,024
833 4,179,025
834 4,179,026

CLASS 200

61.27 4,179,592
292 4,179,593
310 4,179,594

CLASS 202

262 4,179,340

CLASS 204

20 4,179,341
35 N 4,179,342
43 T 4,179,343
44 4,179,344
67 4,179,345
4,179,346
149 4,179,347
151 4,179,348
195 R 4,179,349
284 4,179,350
298 4,179,351

CLASS 206

205 4,179,027
316 4,179,028
349 4,179,029
396 4,179,030
413 Re.30,168

CLASS 208

8 LE 4,179,352
65 4,179,353
89 4,179,354
4,179,355
111 4,179,356
4,179,357
114 4,179,358
139 4,179,359
4,179,360
244 4,179,361
321 4,179,362

CLASS 209

481 4,179,363
534 4,179,031
538 4,179,032

CLASS 210

8 4,179,365
14 4,179,366
41 4,179,367
42 R 4,179,368
43 4,179,369
51 4,179,370
63 R 4,179,371
90 4,179,372
98 4,179,373
151 4,179,374
197 4,179,375
208 4,179,376
230 4,179,377
232 4,179,378
242 R 4,179,379
321 A 4,179,380
321 B 4,179,364
456 4,179,381

CLASS 211

60 R 4,179,033

CLASS 219

10.55 F 4,179,595
10.55 M 4,179,596
56.1 4,179,597
79 4,179,598
121 P 4,179,599
125.1 4,179,602
216 4,179,600
4,179,601
538 4,179,603

CLASS 220

2.3 R 4,179,037
22 4,179,036
243 4,179,038
319 4,179,039
410 4,179,040

CLASS 222

1 4,179,041
44 4,179,048
89 4,179,042
133 4,179,047
368 4,179,043
386 4,179,050
494 4,179,051
509 4,179,052
551 4,179,044
590 4,179,045
600 4,179,046
631 4,179,049

CLASS 224

45 L 4,179,054
190 4,179,053

CLASS 225

80 4,179,055

CLASS 226

171 4,179,056

CLASS 227

19 4,179,057
67 4,179,063
147 4,179,058

CLASS 228

103 4,179,059

CLASS 229

8 4,179,060
27 4,179,061
37 R 4,179,062

CLASS 235

89 R 4,179,610
92 QC 4,179,611
381 4,179,064

CLASS 237

51 4,179,065

CLASS 238

10 E 4,179,066
91 4,179,067

CLASS 239

13 4,179,068
125 4,179,069
333 4,179,070
397.5 4,179,071
533.9 4,179,072
659 4,179,073

CLASS 241

24 4,179,074
67 4,179,075
216 4,179,076

CLASS 242

55 4,179,077
55.53 4,179,078
56 R 4,179,079
86.52 4,179,080
99 4,179,081
129.51 4,179,082
158 R 4,179,083
212 4,179,084

CLASS 244

3.11 4,179,085
3.19 4,179,088
122 AG 4,179,086
175 4,179,087

CLASS 248

216.1 4,179,089
235 4,179,090
265 4,179,091
309 R 4,179,092

CLASS 249

65 4,179,093
82 4,179,094

CLASS 250

203 R 4,179,612
215 4,179,613
253 4,179,614
305 4,179,604
311 4,179,605
339 4,179,606
363 S 4,179,607
385 4,179,608
397 4,179,609
416 TV 4,179,100
423 R Re.30,171
489 4,179,615
527 4,179,616
531 4,179,617
4,179,618
551 4,179,619
566 4,179,620
4,179,621
571 4,179,622
573 4,179,623

CLASS 251

30 4,179,095
38 4,179,096
130 4,179,097
167 4,179,098
168 4,179,099

CLASS 252

8.8 4,179,382
25 4,179,383
32.7 E 4,179,384
4,179,389
33 4,179,385
46.6 4,179,386
62.56 4,179,387
95 4,179,390
99 4,179,391
108 4,179,392
155 4,179,393
186 4,179,394
299 4,179,395
329 4,179,396
408 4,179,397
4,179,398
411 S 4,179,399
429 R 4,179,400
4,179,401
431 C 4,179,402
4,179,403
435 4,179,404
441 4,179,405
442 4,179,406
446 4,179,407
448 4,179,408
455 Z 4,179,409
465 4,179,410
4,179,411
472 4,179,412
4,179,413
548 4,179,414

CLASS 260

4 R 4,179,415
17.4 CL 4,179,416
18 EP 4,179,417
18 PN 4,179,418
21 4,179,420
23.7 M 4,179,421
28.5 B 4,179,422
29.2 M 4,179,426
29.2 N 4,179,423
29.2 TN 4,179,427
29.4 R 4,179,428
4,179,440
29.4 UA 4,179,424
29.6 NR 4,179,425
32.8 R 4,179,429
42.37 4,179,431
45.75 S 4,179,432
112.5 R 4,179,433
4,179,434
158 4,179,435
206 4,179,436
239.1 4,179,437
239.3 P 4,179,438
4,179,439
315 4,179,443
326 N 4,179,444
340.9 R 4,179,445
343.6 4,179,446
345.2 4,179,447
346.11 4,179,448
346.74 4,179,449
377 4,179,450
395 4,179,451
397.1 4,179,453
397.2 4,179,452
409 4,179,454
4,179,455
4,179,456
418 4,179,457
429.7 4,179,458
448 R 4,179,459
455 R 4,179,460
465 H 4,179,461
465.1 4,179,462
502.5 4,179,464
502.6 4,179,463
544 C 4,179,465
558 A 4,179,466
563 R 4,179,467
567.6 M 4,179,468
577 4,179,469
580 4,179,470
706 4,179,476
941 4,179,482
4,179,483

CLASS 261

114 R 4,179,487

CLASS 264

1 4,179,484
44 4,179,485
65 4,179,486
521 4,179,488

CLASS 266

77 4,179,101
218 4,179,102
225 4,179,103

CLASS 267

154 4,179,104

CLASS 269

8 4,179,105
20 4,179,106

CLASS 270

4 4,179,107
31 4,179,108
52 4,179,109
58 4,179,110
68 R 4,179,111

CLASS 271

3 4,179,112
12 4,179,113
19 4,179,114
251 4,179,117
277 4,179,118
297 4,179,115
306 4,179,116

CLASS 272

75 4,179,119

CLASS 273

49 4,179,120
73 R 4,179,121
85 R 4,179,122
89 4,179,123
101.2 4,179,124
162 B 4,179,125
240 4,179,126
241 4,179,127
243 4,179,128
272 4,179,129

CLASS 277

84 4,179,130
165 4,179,131

CLASS 280

47.26 4,179,132
87.04 A 4,179,134
87.04 R 4,179,133
276 4,179,135
744 4,179,136
775 4,179,137

CLASS 281

15 B 4,179,138

CLASS 282

11.5 R 4,179,140
23 R 4,179,139

CLASS 285

189 4,179,141
239 4,179,142

CLASS 292

179 4,179,143
202 4,179,144

CLASS 294

19 R 4,179,145
27 H 4,179,146
50.7 4,179,147
78 R 4,179,148
81 SF 4,179,149
83 R 4,179,150
89 4,179,151

CLASS 296

37.1 4,179,153
91 4,179,154
97 C 4,179,155
137 B 4,179,156
196 4,179,152

CLASS 297

83 4,179,157
118 4,179,158
192 4,179,159

CLASS 299

12 4,179,160
34 4,179,161

CLASS 301

5 BA 4,179,162
37 SS 4,179,163

CLASS 303

24 F 4,179,164
59 4,179,165
119 4,179,166

CLASS 307

3 4,179,624
234 4,179,625
238 4,179,626
261 4,179,627
279 4,179,628
311 4,179,629

CLASS 308

189 A 4,179,167

CLASS 310

15 4,179,630
20 4,179,631
50 4,179,632
80 4,179,633
153 4,179,634
214 4,179,635

CLASS 312

125 4,179,168
257 R 4,179,169

CLASS 313

274 4,179,636
316 4,179,637
480 4,179,638

CLASS 315

39.69 4,179,639
47 4,179,640
169.4 Re.30,172
289 4,179,641
370 4,179,642
411 4,179,643

CLASS 318

17 4,179,644
139 4,179,645
380 4,179,646

CLASS 320

6 4,179,647
11 4,179,648
13 4,179,649

CLASS 323

1 4,179,650

CLASS 324

51 4,179,651
64 4,179,652
65 CR 4,179,653
116 4,179,654
132 4,179,655
166 4,179,656

CLASS 325

33 4,179,657
34 4,179,658
38 B 4,179,659
59 4,179,660
455 4,179,661
470 4,179,662

CLASS 328

59 4,179,663
150 4,179,664

CLASS 330

107 4,179,665
138 4,179,666
149 4,179,667
257 Re.30,173
277 4,179,668
282 4,179,669

CLASS 331

10 4,179,670
116 FE 4,179,671

CLASS 332

16 R 4,179,672

CLASS 333

204 4,179,673
4,179,674

CLASS 335

9 4,179,675
59 4,179,676

CLASS 337

161 4,179,677
293 4,179,678
407 4,179,679

CLASS 338

25 4,179,680

CLASS 339

14 R 4,179,170
17 LC 4,179,171
17 LM 4,179,172
19 4,179,173
22 B 4,179,174
42 4,179,175
74 R 4,179,176
4,179,177
111 4,179,178
186 M 4,179,179
189 R 4,179,180

CLASS 340

146.3 AE 4,179,684
146.3 AG 4,179,686
146.3 H 4,179,685
347 AD 4,179,687
373 4,179,688
378.3 4,179,689
384 E Re.30,174
4,179,690
567 4,179,691
573 4,179,692

CLASS 343

5 AF 4,179,694

5 MM 4,179,693
6.5 R 4,179,695
7.4 4,179,696
112 D 4,179,697
715 4,179,698
872 4,179,699
885 4,179,700

CLASS 346

62 4,179,701

CLASS 350

1.7 4,179,181
3.69 4,179,182
6.1 4,179,183
96.14 4,179,184
96.16 4,179,185
96.21 4,179,186
96.30 4,179,187
96.31 4,179,188
96.33 4,179,189
152 4,179,190
187 4,179,191
294 4,179,192
295 4,179,193
356 4,179,194

CLASS 351

4 4,179,195
30 4,179,196

CLASS 352

14 4,179,197
100 4,179,198
138 4,179,199

CLASS 354

1 4,179,200
41 4,179,201
43 4,179,202
106 4,179,203
145 4,179,204
4,179,205
152 4,179,206
308 4,179,207
320 4,179,208

CLASS 355

3 P 4,179,209
10 4,179,210
14 R 4,179,211
4,179,212
4,179,213
35 4,179,214
50 4,179,215

CLASS 356

4 4,179,216
33 4,179,217
336 4,179,218
346 4,179,219

CLASS 357

30 4,179,702

CLASS 358

11 4,179,703
22 4,179,704
31 4,179,705
44 4,179,706
107 4,179,707
128 4,179,708
133 4,179,709
135 4,179,710
213 4,179,711

CLASS 360

14 4,179,712
27 4,179,713
61 4,179,714
4,179,715
74.3 4,179,716
84 4,179,717
99 4,179,718
112 4,179,719
113 4,179,720
137 4,179,721

CLASS 361

293 4,179,722
384 4,179,723
391 4,179,724
433 4,179,725

CLASS 362

17 4,179,726

CLASS 363

41 4,179,727
59 4,179,728
175 4,179,729

CLASS 364

105 4,179,730
200 4,179,731
4,179,732
4,179,733
4,179,734
4,179,735
4,179,736
4,179,737
4,179,738
436 4,179,739
442 4,179,740
457 4,179,741
494 4,179,742
518 4,179,743
551 4,179,744
571 4,179,745
900 4,179,746
4,179,747
4,179,748

CLASS 365

3 4,179,749
8 4,179,750
228 4,179,751

CLASS 366

102 4,179,220
309 4,179,221
337 4,179,222

CLASS 367

110 4,179,681
135 4,179,682
138 4,179,683

CLASS 400

320 4,179,223
637 4,179,224

CLASS 403

322 4,179,225

CLASS 404

64 4,179,226

CLASS 405

182 4,179,227

CLASS 406

63 4,179,232

CLASS 407

57 4,179,228

CLASS 408

39 4,179,229
4,179,230
112 4,179,231

CLASS 409

80 C 4,178,834

CLASS 414

2 4,179,035
117 4,179,236
139 4,179,233
268 4,179,234
351 4,179,235
551 4,179,034

CLASS 415

1 4,179,237
197 4,179,238
198.1 4,179,239

CLASS 416

96 R 4,179,240
137 4,179,241

CLASS 417

8 4,179,242
61 4,179,243
273 4,179,244
292 4,179,245
313 4,179,246
406 4,179,247
427 4,179,248
477 4,179,249

CLASS 418

195 4,179,250

CLASS 423

79 4,179,489
165 4,179,490
253 4,179,491
263 4,179,492
279 4,179,493
456 4,179,494
531 4,179,495
598 4,179,496

CLASS 424

22 4,179,497
117 4,179,498
143 4,179,499
180 4,179,500
226 4,179,501
246 4,179,502
248.4 4,179,504
248.51 4,179,503
250 4,179,505
256 4,179,506
258 4,179,507
4,179,508
266 4,179,509
267 4,179,510
271 4,179,511
273 R 4,179,512
274 4,179,513
277 4,179,514
278 4,179,515
4,179,516
283 4,179,517
300 4,179,518
308 4,179,519
309 4,179,520
4,179,521
317 4,179,522
324 4,179,523
4,179,524

CLASS 425

67 4,179,255
71 4,179,256
140 4,179,251
174.6 4,179,252
331 4,179,257
352 4,179,258
369 4,179,253
438 4,179,254
461 4,179,259

CLASS 426

19 4,179,525
535 4,179,526
620 4,179,527

CLASS 427

9 4,179,528
44 4,179,529
51 4,179,530
54.1 4,179,532
84 4,179,533
89 4,179,534
206 4,179,535
224 Re.30,169
239 4,179,536
387 4,179,537

CLASS 428

58 4,179,539
71 4,179,540
165 4,179,541
324 4,179,542
361 4,179,543
395 4,179,544
447 4,179,295

CLASS 429

65 4,179,545

CLASS 430

34 4,179,290
108 4,179,388
175 4,179,292
213 4,179,538
223 4,179,291
300 4,179,531
522 A 4,179,294
551 4,179,293
574 4,179,296

CLASS 431

255 4,179,260
286 4,179,261
354 4,179,262

CLASS 432

1 4,179,263
13 4,179,264
36 4,179,265

CLASS 433

13 4,178,687
166 4,178,689
201 4,178,686
220 4,178,688

CLASS 435

55 4,179,336
60 4,179,333
99 4,179,335
181 4,179,337
243 4,179,338
254 4,179,266
292 4,179,339

CLASS 521

56 4,179,546

CLASS 525

2 4,179,547
66 4,179,479
80 4,179,481
99 4,179,480
113 4,179,478
284 4,179,477
329 4,179,548
374 4,179,549

CLASS 526

212 4,179,550
262 4,179,551

CLASS 528

111 4,179,552
168 4,179,553
4,179,554
4,179,555
4,179,556
327 Re.30,170

CLASS 544

28 4,179,557
174 4,179,558
237 4,179,559
250 4,179,560
4,179,561
298 4,179,562
360 4,179,563

CLASS 546

63 4,179,565
64 4,179,564
116 4,179,566
124 4,179,567
208 4,179,568
223 4,179,569
251 4,179,576
252 4,179,570
349 4,179,580

CLASS 548

122 4,179,441
232 4,179,442

CLASS 560

52 4,179,577
64 4,179,571
76 4,179,578
115 4,179,572

CLASS 562

444 4,179,573
503 4,179,574
506 4,179,575

CLASS 568

840 4,179,579

CLASS 585

251 4,179,474
313 4,179,473
452 4,179,471
4,179,472
714 4,179,475
744 4,179,581

CLASSIFICATION OF DESIGNS

D2— 400 253,676
D6— 31 253,677
56 253,678
66 253,679
146 253,680
D7— 39 253,681
253,682
107 253,683
109 253,684
187 253,685
D8— 312 253,686
D10— 59 253,687
70 253,688
73 253,689
85 253,690
253,691
109 253,692
126 253,693
D11— 79 253,694
D12— 22 253,695
55 253,696
162 253,697
D13— 12 253,698
D14— 33 253,699
35 253,700
42 253,701
46 253,702
65 253,703
D15— 7 253,704
69 253,705
104 253,706
199 253,707
D16— 21 253,708
D19— 62 253,709
D21— 78 253,710
166 253,711
199 253,712
212 253,713
255 253,734
D22— 13 253,714
D23— 4 253,715
19 253,716
28 253,717
95 253,718
136 253,719
D24— 25 253,720
52 253,721
56 253,722
67 253,723
D25— 92 253,724
D27— 07 253,725
D28— 46 253,726
253,727
67 253,728
D30— 6 253,729
9 253,730
38 253,731
D48— 2 253,732
24 A 253,733
D92— 29 253,735

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,179,085	4,178,803	4,179,588	4,179,684	4,179,397	4,178,6^2
4 :	4,179,047	4,178,807	4,179,596	4,179,685	4,179,405	4,178,701
	4,179,087	4,178,823	4,179,597	4,179,738	4,179,406	4,178,709
	4,179,172	4,178,825	4,179,612	13 : 4,178,659	4,179,424	4,178,715
6 :	4,178,643	4,178,832	4,179,637	4,179,007	4,179,469	4,178,740
	4,178,707	4,178,854	4,179,674	4,179,180	4,179,525	4,178,797
	4,178,759	4,178,855	4,179,689	4,179,235	4,179,581	4,178,911
	4,178,853	4,178,897	4,179,695	4,179,531	4,179,625	4,178,917
	4,178,916	4,178,907	4,179,705	15 : 4,178,717	4,179,644	4,178,939
	4,179,182	4,178,927	4,179,709	16 : 4,178,791	4,179,649	4,179,063
	4,179,327	4,178,931	4,179,717	4,179,017	4,179,698	4,179,190
	4,179,441	4,178,947	4,179,718	17 : 4,178,645	18 : 4,178,667	4,179,199
	4,179,665	4,178,952	4,179,726	4,178,647	4,178,700	4,179,205
	4,179,693	4,178,965	4,179,732	4,178,673	4,178,811	4,179,272
	4,179,740	4,178,970	4,179,737	4,178,688	4,178,998	4,179,318
8 :	4,178,678	4,178,992	4,179,739	4,178,725	4,179,269	4,179,324
	4,178,910	4,179,001	4,179,745	4,178,735	4,179,371	4,179,620
	4,179,117	4,179,004	4,179,748	4,178,737	4,179,647	4,179,634
	4,179,162	4,179,006	4,179,749	4,178,739	4,179,666	4,179,639
	4,179,265	4,179,030	4,179,750	4,178,751	19 : 4,178,729	4,179,652
	4,179,351	4,179,037	08 : 4,178,638	4,178,757	4,178,813	4,179,657
	4,179,492	4,179,038	4,178,644	4,178,828	4,178,833	4,179,669
9 :	4,178,637	4,179,042	4,178,693	4,178,842	4,178,943	4,179,678
	4,179,048	4,179,054	4,179,213	4,178,857	4,178,956	4,179,728
	4,179,078	4,179,059	4,179,322	4,178,870	4,178,999	4,179,729
	4,179,181	4,179,071	09 : 4,178,656	4,178,926	4,179,034	26 : 4,178,648
	4,179,192	4,179,080	4,178,661	4,178,932	4,179,053	4,178,662
	4,179,212	4,179,086	4,178,758	4,178,937	20 : 4,178,671	4,178,727
	4,179,223	4,179,097	4,178,767	4,178,976	4,179,445	4,178,730
	4,179,559	4,179,125	4,178,781	4,178,977	21 : 4,178,712	4,178,733
01 :	4,179,051	4,179,132	4,178,820	4,178,987	4,178,734	4,178,790
	4,179,088	4,179,133	4,178,918	4,179,024	4,178,765	4,178,793
	4,179,599	4,179,135	4,178,928	4,179,027	4,178,839	4,178,812
02 :	4,178,878	4,179,142	4,178,990	4,179,113	22 : 4,179,409	4,178,844
04 :	4,178,668	4,179,150	4,179,111	4,179,138	23 : 4,178,906	4,178,856
	4,178,949	4,179,152	4,179,196	4,179,140	24 : Re.30,174	4,178,895
	4,179,018	4,179,163	4,179,248	4,179,158	4,178,850	4,178,905
	4,179,169	4,179,194	4,179,511	4,179,165	4,179,081	4,179,015
	4,179,266	4,179,219	4,179,646	4,179,170	4,179,089	4,179,052
	4,179,736	4,179,239	4,179,704	4,179,241	4,179,127	4,179,061
06 :	Re.30,171	4,179,310	4,179,747	4,179,249	4,179,285	4,179,091
	4,178,639	4,179,319	10 : 4,179,276	4,179,305	4,179,400	4,179,128
	4,178,650	4,179,320	12 : 4,178,736	4,179,316	4,179,408	4,179,137
	4,178,660	4,179,361	4,178,754	4,179,325	4,179,586	4,179,154
	4,178,674	4,179,375	4,178,829	4,179,329	4,179,591	4,179,157
	4,178,690	4,179,410	4,178,954	4,179,330	4,179,626	4,179,159
	4,178,694	4,179,411	4,179,122	4,179,349	4,179,627	4,179,171
	4,178,708	4,179,486	4,179,148	4,179,356	4,179,658	4,179,204
	4,178,718	4,179,523	4,179,151	4,179,357	4,179,675	4,179,245
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	4,178,775	4,179,582	4,179,468	4,179,364	25 : 4,178,646	4,179,343
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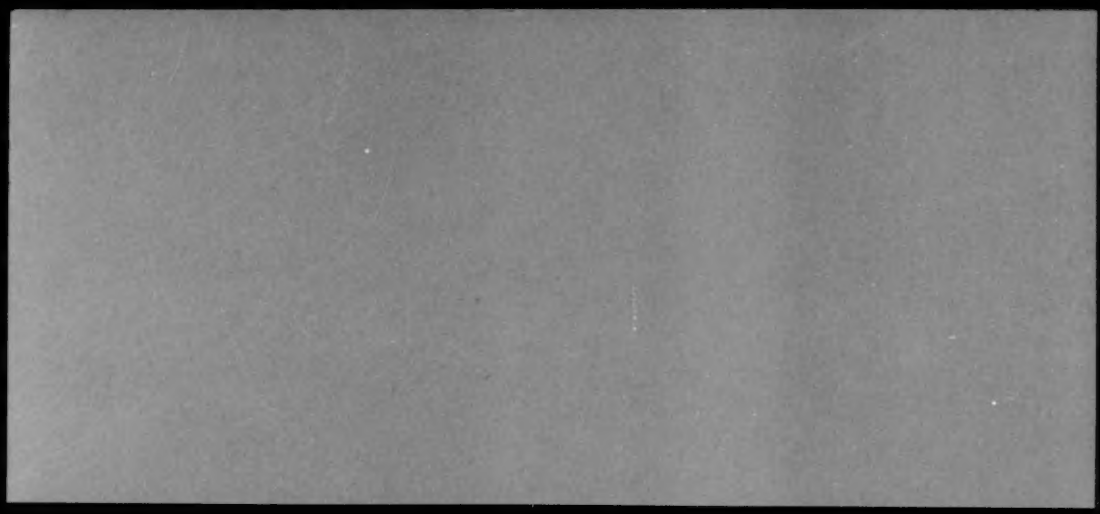

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Luther H. Hodges Jr., *Acting Secretary*

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Sidney A. Diamond, *Commissioner*